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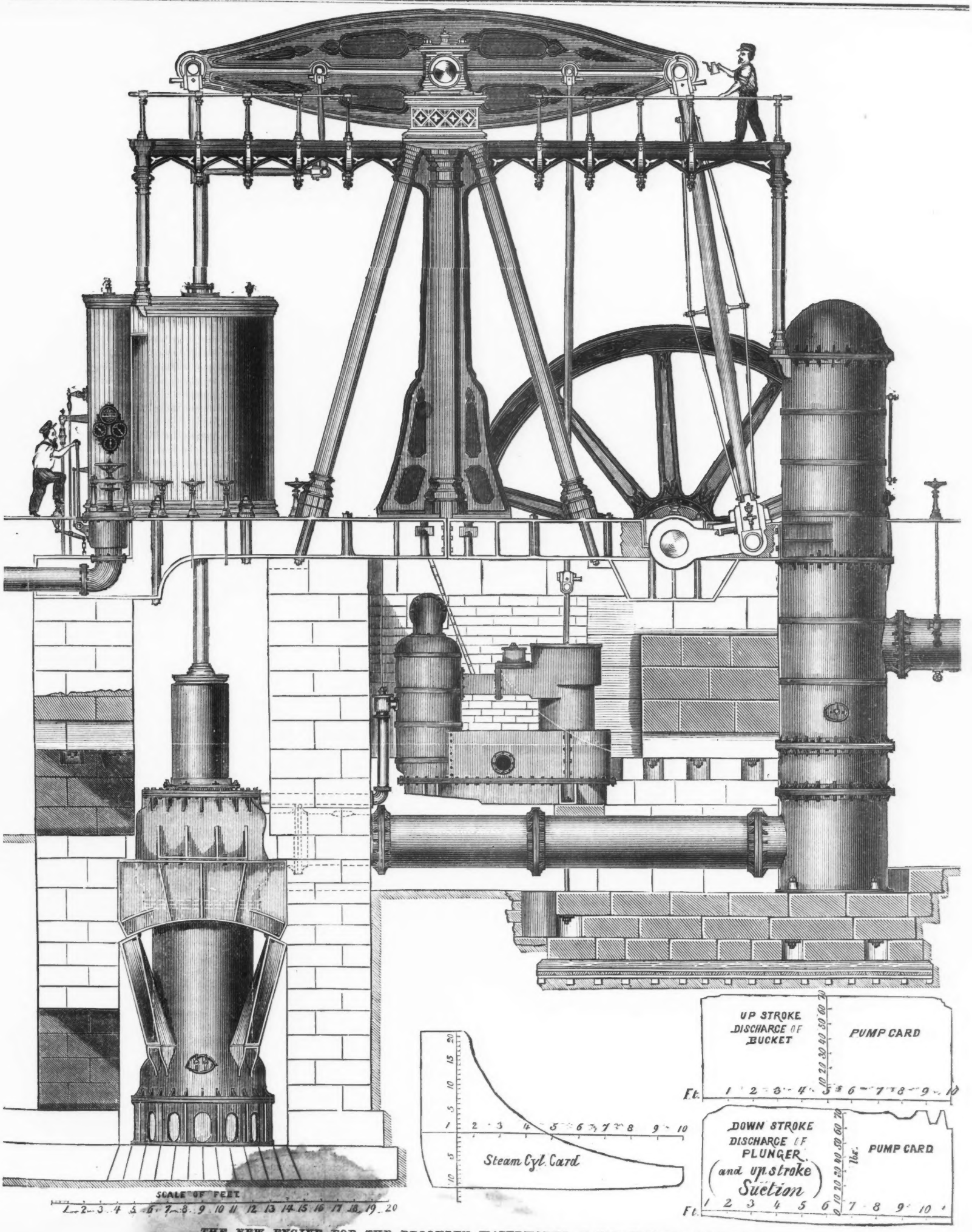

SCALE OF FEET
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Steam Cyl. Card
UP STROKE DISCHARGE OF BUCKET
PUMP CARD
Ft.
DOWN STROKE DISCHARGE OF PLUNGER (and up stroke Suction)
PUMP CARD
lbs.
Ft.

THE NEW ENGINE FOR THE BROOKLYN WATERWORKS.—Built by Hubbard and Whittaker.

Items Read at the Polytechnic Club of the American Institute.

Meeting held at the Rooms of the Association, March 24, 1870, Professor S. D. TILLMAN in the Chair.

THE GRAPHOTYPE.—This ingenious substitute for wood engraving, now used extensively in Europe, is the invention of Mr. DE WITT CLINTON HITCHCOCK, an American. The process consists in coating sheet zinc with a surface which can be easily removed, excepting that portion covered by the drawing. Over a smooth zinc plate is thinly spread very fine pure chalk powder, and on this is placed a highly-polished steel plate, when the whole is subjected to a pressure of 150 tons. After removing the steel plate, the perfectly smooth and ivory-like surface of chalk remaining is covered with a wash of strong size, and when dry is ready to receive a line drawing, similar to that made on wood. The drawing is made with sable-hair brushes of different sizes, wet with an ink composed of glue and lampblack with a little glycerine, or of a solution of borax and shellac with lampblack. After the drawing is completed, the surface is submitted to the action of a rotating brush, which removes all the chalk coating not covered by the ink, thus leaving the drawing in relief. To protect this surface, it is coated with a solution of water-glass which hardens it, so that a mould can be taken from it in the ordinary manner, from which the electrotype or stereotype, to be used in printing, is made. In this case, the artist is the author of the engraving, and is sure to find the picture reproduced precisely as he made it. This result is obtained with readiness and at a trifling cost, and for many kinds of illustration, the process is found to have advantages over ordinary wood engraving.

Mr. FISHER said that the graphotype process was in use in this country some eight or nine years ago. There was some substance then used in connection with it that was slightly poisonous. Some remarks were then made about the difficulty of obtaining a substitute for wood engraving, and the reasons for the abandonment of this process.

CARBOLIC COLLODION.—Dr. J. M. HIRSH of Chicago, has published in a new journal, *The Arts*, a description of the method of preparing his new mixture for stopping hemorrhage. Taking advantage of the astringent property in carbolic acid, which even in dilute solution will check the flow of blood, he prevents external coagulation—objectionable on account of its liability to break off and allow the flow to commence anew—by adding to carbolic acid, or phenol, collodion, which almost instantly forms an artificial covering closely fitting the wound, so that coagulation has to take place within or beneath this coating. Ordinary collodion, which is a solution of gun-cotton dissolved in ether, contracts greatly upon the evaporation of the latter, and frequently scales off. To obviate this, he uses glycerine, which has the property of rendering the collodion elastic. He finds that carbolate of glycerine is soluble in all proportions in collodion. The highly irritating and poisonous property of carbolic acid suggests that it should be used very sparingly in this compound.

Mr. MONTGOMERY related some personal experience in connection with this subject, showing that the vapor from carbolic acid was available for preventing or arresting hemorrhage of the lungs. The compound that he used was not yet made public, but it was understood that the carbolic acid played an important part in it.

Mr. COLEMAN narrated the effect that cresylic acid had had in arresting and breaking up the whooping cough in his family. He placed the acid in saucers in the rooms. The change for the better was very decided. The cresylic was merely the anhydrous form of the carbolic acid, and would have a similar effect. It was formerly said that children should be taken to a gas house to cure the whooping cough; the presence of this gas, and its action upon the lungs, would account for this.

Mr. SHELBURNE said that the use of carbolic acid in the cure of whooping coughs, bronchitis, etc., was not new, and cited experiments made in London in proof of his statement.

PREPARATION OF FIBRE FOR SHODDY.—The wool fibre of old rags and carpets, made of a combination of wool or linen threads, can be separated by the use of metallic chlorides or sulphates, the chloride of aluminum being the most available. To obtain the latter, 100 pounds of sulphate of aluminum is dissolved in 100 gallons of hot water; on adding to this solution 50 pounds of common salt, a chemical change produces sulphate of sodium and chloride of aluminum. After the rags have been saturated with a solution of chloride of aluminum, the excess of liquid is drained off and the material is heated to about 200 degrees Fahrenheit. The chloride of aluminum is decomposed during this process, and the volatile products, acting on the cotton or linen, decompose it, while the animal fiber remains unchanged, and on being rubbed up or carded the vegetable matter is separated in the form of dust. In some cases it is found more effective to first immerse the rags in a strong solution of sulphate of aluminum, and then place them in a saturated solution of common salt, which is boiled until the decomposing or rotting process is completed.

Mr. FISHER thought that when shoddy was brought forward, a scientific society should put it down. It was then remarked that no process of preparation could make worn out fibre again available. Old clothes are not to be made out of new. It was stated upon good authority that of one hundred and thirteen mills in New England that were included in the examination, only three were found that did not use shoddy.

DIAMONDS AND QUARTZ.—*The Quarterly Journal of Science* says on a question so obscure and enigmatical as that of the origin of the diamond, every title of evidence is worth recording. Dr. GÖPPERT, in his famous essay which gained a prize at the Haarlem Academy in 1864, argued strongly in favor of the formation of this mineral by the wet way. He now publishes an account of certain diamonds containing organic structures tending to confirm his views. Two diamonds in the Royal Mineralogical Museum in Berlin were found to inclose numerous green cells closely resembling those of many algæ. One of the diamonds, weighing 263 milligrammes, contains a very large number of perfectly round green granules, which appear to be isolated cells not unlike those of *Protoccus pluvialis*. The new species is accordingly named P. *adamantinus*. In the second diamond, weighing 345 milligrammes, the cells are less rounded and more elongated in form, while they frequently unite so as to form a loose parenchymatous tissue; they find their best representatives in *Palmoglea macrococca*, and GÖPPERT has accordingly ventured to name the new diamond plant *Palmagloeites adamantinus*.

Once again the old mistake has been repeated in Australia. In the N. E. district a stone was found, about the size and shape of a duck's egg, and weighing 6 oz. 13 dwts. 12 grs. Troy. Of course it was taken for a diamond, and rumor was soon rife as to its prodigious worth. A few days after announcing the discovery *The Australian Mail* coolly adds: "The great diamond which had created so much sensation has proved to be a piece of crystal-quartz."

Spectrum analysis has been applied by VOGELSANG and GEISSLER to the difficult question of determining the chemical nature of the fluid found inclosed, in minute quantity, in the cavities of certain quartz-crystals. Fragments of quartz were placed in a small retort which was connected with an air-pump and exhausted; then by the application of heat the quartz decripitated, and the evolved vapor was examined in a Geissler-tube. The presence of carbonic acid was thus abundantly proved, and this was confirmed by the turpidity which it produced in lime-water.

SPONTANEOUS MOTION OF PROTOPLASM.—Prof. J. B. SCHNETZLER, in his observations on the spontaneous motion of the protoplasm in the cells of the leaves of the common water-weed, *Anacharis alsinastrum*, recently published, expresses the opinion that the principal cause which provokes the motion is the chemical action of oxygen, which passes through the wall of the cell, and of which a portion is probably transformed into ozone under the influence of light, as occurs also in the globules. The currents thus produced are influenced by the highest refracted rays of light, and also, probably, by electricity formed under the influence of water between the surface of the leaf and the contents of the cells.

An interesting discussion took place upon the liquids found in quartz and other crystals, the rock associated with the diamond, and similar substance.

VEGETABLE PARASITES.—In a paper read before the Illinois State Microscopical Society, Dr. N. S. DAVIS says: It is a fact worthy of note that, up to the present time, vegetable parasites have been found only in connection with diseases of such structures as are covered with epithelial cells, like the skin and mucous membrane, or on suppurative surfaces, where the organic cells are undergoing more or less degeneration. This legitimately suggests the question whether all these parasitic forms of matter are not the results of what ERASMUS WILSON has styled *Phytiform*—degeneration of cells and granules of animal matter? But aside from all such questions of a histological character, the study of parasitic growths in connection with the prevalence of diseases, especially of an epidemic character, is of the highest importance in its bearing on sanitary regulations, and the health of communities. In this direction, some things of great importance may be considered as already settled. Whatever may be the differences of opinion among observers in relation to the nature and mode of development of these simple parasitic bodies, found in connection with epidemic and some endemic diseases, all agree that their production and rapid multiplication are directly dependent on the co-existence of three things, viz., organic matter capable of undergoing degeneration or decay, moisture, and a temperature generally above 60° F. If, with these, we have coincidently the exclusion of sunlight, we have the conditions most favorable for all vegetable parisitic formations. If the co-operation of these causes will generate a cholera fungus in the Valley of the Ganges, we see no reason why they will not do the same in the Valley of the Mississippi, or in Chicago. But whether the cholera fungus is generated here or imported from the other hemisphere, it is certain that, without the co-operation of the three first-named conditions, neither it nor any other fungus can be propagated, to the injury of individual or public health. Hence, whatever contributes to the prompt removal, from this or any other city, of the decomposable organic matter, the surplus water or moisture, and gives to all its inhabitants air and sunlight, contributes directly to the public health.

Dr. RICHARDS said that influenza (a disease admitted to be of this class) prevails at a season when the temperature is often below 60°. May not these fungoids survive the warm weather living into the winter? If the influenza is caused by a parasite, it is one that can live in a temperature much below 60°. This disease commences at the South and comes North, as the shad do. The speaker thought there was some morbid cause, which moves from one part of the country to another. It took four weeks for it to travel from this city to Brunswick, Maine, as an instance related proved.

Mr. DARBY said it was an open question whether it was living organisms or dead animal matter decaying that caused this disease, and did not regard influenza a zymotic disease, but thought it connected with ozone, for where the latter exists the former does not.

Mr. EDWARDS thought there were not facts enough to decide this question. Some hints were then given as to the complexity of the forces working in our atmosphere. His direction to the people of the South, in the yellow fever times was, to light their fires and go up-stairs, at sundown, and they escaped who followed the advice. Life is never lost, it is eternally changing. These little animals in the air have each their own particular food—the one the throat, another the stomach, the intestinal canal, etc. In speaking of the atmospheric effects, the fact was noticed that three o'clock in the morning was the most fatal time in these diseases; if a patient passed that hour, he was safe until the next day. Vitality is at the lowest ebb at that time. The electricity is the lowest in the air and in the human system, and this should be excited to save the patient.

The PRESIDENT said, in answer to some remarks, that TYNDAL and REEVES were making a series of observations, to give the contents of the air at times when epidemics rage.

The San Diego Gold Mines.

The following outburst of humor and Western wit, from the Nevada *Evening News*, in relation to the newly discovered San Diego gold mines, which have produced such a commotion on the Pacific coast, contains such happy hits and illustrates the excitement and the spirit of exaggeration connected with new discoveries, so well, that we cannot refrain from giving the article in full:

"Brier's second cousin, who happened to be down at San Diego when those rich mines were discovered a few days ago, sends us under date of March 10th, the following graphic account of matters and things interesting, relative to that new and exciting El Dorado, to rush after:

"WASHINGTON CITY.

"I arrived at this place two days after the gold discovery and helped to organize it. The town is beautifully situated on the sloping flat just below the George Washington ledge, which was the first discovered, and is laid out in squares and blocks, some like Carson, only more so, with three splendid public plazas, two colleges, and a female seminary, handsomely projected and painted in choice colors on the map, with trees, flowers, and shrubbery, properly represented. The International Hotel is opposite Wells, Fargo & Co.'s, and the telegraph office is in the same block with the California Bank. The gas works have already commenced operations. Town lots are selling very reasonably, as yet, only $30,000 being charged for corner lots, but prices double every day, so the sooner you go in for a corner the better; I have one which I will let you have for $10,000 less, as a personal favor. This city is 47½ miles from San Diego, but round by way of Mud Springs it is some further. Seventeen stage lines are already going to run here—but only two have got started. Every approach on every side is claimed as a toll-road. The population numbers, including Greasers, Chinamen and Jackasses, from one to eleven thousand, all of whom are rich in feet, town lots, and mill sites, but not in coin, by a d—d sight. There are only two regular houses built in town—the Ward Beecher saloon and the Ham-fat restaurant—but the foundations for several hundred are already arranged. Lumber is $300 a thousand, and I have located the only timber ranch within ten miles. Fetch down plenty of money, whiskey and grub, when you come, and you can board with me. Bring along all your friends. Tell everybody to come and get rich, and to bring along all their money. Take the San Diego line of steamers and none other. Never mind if the fare is raised a little. Sure to get rich here. Dead open and shut on it. Big thing.

"THE MINES.

"The George Washington ledge was discovered on the 22d of February, hence its name. It runs due east and west, and is about four feet wide. The first location is 4,400 feet, of which I hold 2,500 feet, and extensions are taken up each way over 60 miles. I don't think much of the extensions. I expect to be made superintendent, and we shall incorporate at once, in order to get the stock into market as soon as possible. We have sent a few tons of poor rock from the croppings up to San Francisco for exhibition. It will only pay about $5,000 to the ton. Our main shaft is already 2½ feet deep, and at that depth the gold is nearly half rock. We work with hammers and cold chisels altogether, and the ore grows richer as we go down. Most of our best specimens ore goes from $350 to $400 to the pound. Some Chinamen have found a ledge just over the left, around the brow of the hill, which is richer, but we shall claim it as a spur of this one; yes, and prove it, too. I have several other very rich ledges located, which show principally gold on top, mixed some with quartz, and no base metal whatever. I suppose them to be rich, as the surface dirt about them pays $10 to the pan. Passengers coming by the San Diego line will find all the rich claims they want, or they will be sold cheap (the claims, not the passengers).

"THE RUSH.

"Nobody ever saw or heard of such a rush as the one just now commencing. White Pine is nothing but a barren pot-metal deposit compared to this rich country, where everything is glorious and green. Everybody has left San Diego and Los Angeles, and the old women and cripples are bringing up the rear. I expect the San Diego line will have to put on forty more steamers to accommodate the rush from Washoe and northern California. The fare is raising fast, so the sooner everybody gets here the cheaper it will be for them. Tell everybody not to hesitate, but sell out for whatever they can get, or just drop everything and *rush*. Rush by all means. Grub is cheap here, and I own all the beans. Sell all the town lots you can for me, at what you can get, and we'll divide even on it. You never dreamt of such a rush by the San Diego line, which has the only safe steamers on the coast. The town title is first-rate, and as it never storms here, everybody can sleep in the open air comfortably at present. We have a splendid big grave-yard started close to town. Wild cats are rather plenty, and getting more so; but who's afraid? Well, no more now. You may publish this as perfectly re-*lie*-able.

"P.S.—One of my partners has just struck a ledge five times as rich as any yet. Wait till I send you a hundred-pound specimen."

Determination of Iron with Dichloride of Copper.

TO THE EDITOR—Sir: The following translation of Dr. WINKLER'S method for the determination of iron by means of the dichloride of copper, is sent, with the hope that it will not be without interest to those readers of your journal who have felt the need of a better method than that with permanganate of potash, and who may not have had the opportunity of reading the foreign journals. The original may be found in the *Journal für Praktische Chemie*, volume 95, No. 15, 1865. EZHST.

During the last few years, much labor has been spent in order to find a method of determining iron volumetrically, based on the conversion of sesquioxide to protoxide; therefore a process opposite to the former methods for determining this metal, which require the iron as protoxide.

The reducing agents that have been in use up to this time, are protochloride of tin and iodide of potassium. The reduction of the sesquioxide of iron in either process requires a high temperature, and this, as well as other slight difficulties, which require more or less time, and a practical and careful hand to overcome, has been the reason that these methods until now have with difficulty gained admittance into technical laboratories.

The dichloride of copper is a much more powerful reducing agent for sesquioxide of iron, though analogous to protochloride of tin in its effects. While protochloride of tin causes but a partial reduction in a cold solution, dichloride of copper acts directly with theoretical accuracy at the lowest temperature, and in any dilution. It is, therefore, particularly adapted for the volumetric determination of iron, as will be better seen from the following:

If a solution of dichloride of copper be dropped into a dilute solution of sesquichloride of iron, the yellow color of the latter is destroyed, and at last the solution takes the light blue of the dichloride of copper. The reaction is simple, namely:

$$Fe_2 Cl_3 + Cu_2 Cl = 2\ Fe\ Cl + 2\ Cu\ Cl.$$

The completion of the reduction in this case is not shown by any decisive change in the solution, and therefore could not be used in this form. From the characteristic properties of the chlorides of iron and copper, it was not difficult to find an indicator which would make the completion of the reduction evident to the eye.

When a few drops of molybdate of ammonia are added to the acid solution of chloride of iron, the solution takes a deep blue with the least excess of chloride of copper. If instead of the molybdate of ammonia, iodide of potassium be used, a slight precipitate of diniodide of copper is produced by the next drop of dichloride of copper after the reduction is complete, which renders the solution turbid. Finally, if starch solution be added and a few drops of the tincture of iodine, the whole is colored blue by the iodide of starch formed; but this is bleached again by the least excess of the copper solution. It was found that among these different indicators none showed the end of the reaction with absolute exactness. To be sure, the results were often right, but many times differed from one to two per cent., and I found myself compelled to find a surer sign.

A solution of sulphocyanide of potassium was found to be perfectly adapted to this purpose. A few drops of this, added to the solution to be tested, gives the well known deep red color. When the dichloride solution is dropped into one of iron so colored, the red color becomes lighter and lighter, and finally disappears entirely. After the solution is bleached, the reduction of the iron is complete, and the next drop of copper solution causes a precipitate of the disulphocyanide of copper. This gives a double indicator of the end of the reduction, namely, the dying of the red color of the sulphocyanide of iron, and the cloudiness produced by the insoluble salt of copper.

The rapidity and simplicity of the process, as well as the few accessories required, recommend this method especially to technical laboratories, where the want of a short and accurate process has ever been felt. For carrying out the above mentioned determination, there is needed—

1st. *A solution of dichloride of copper.* This is made by dissolving sheet copper in nitric acid, then evaporate to drive off the excess of nitric acid, and the residue is taken up in water containing hydrochloric acid. This solution is put into a flask, and a quantity of common salt (Na Cl), equal in weight to the residue of dry copper salts, is added, in order to prevent the separation of a precipitate of dichloride of copper during the subsequent reduction. Several pieces of sheet copper are put in the flask, and it is then heated to boiling. This is continued until the solution is nearly colorless, and all the chloride of copper has been changed to dichloride. The flask is then corked and allowed to cool; then the solution is diluted with water containing hydrochloric acid until a cubic centimeter corresponds to 6 Mgm. of iron. In order to keep this solution without change, for further use, it should be poured into a bottle, to which is fitted an air-tight stopper, and a spiral of thick copper wire reaching from the bottom to nearly the neck. This completely protects the dichloride of copper from a higher oxidation, so that the strength of the solution remains nearly always the same. A fresh prepared solution, for example, reduced per cubic centimer 6 Mgm. of iron from sesqui to protoxide, and after four months, with the exception of slight changes at times from 0.1 to 0.2 Mgm., remained the same, although the bottle was in almost continual use, and often opened. I took, indeed, the precaution to keep the greater part of the solution in a large bottle, provided with a wire spiral, while for use there was a small bottle, which could be filled, when empty, from the large one. Of course, the solution would become stronger by the action of the air and acid on the copper wire, but by the addition of a little water, it is easy to bring it back to its normal strength.

Without doubt, good results would be obtained by using the method of FRESENIUS for keeping the solution of protochloride of tin, which consists in keeping the oxidable liquid protected by alkaline pyrogallate of potash. It hardly need be mentioned here that the copper solution must not be allowed to stand in the burette from day to day. In all cases it is best and most accurate to determine the strength of the standard from time to time, since this requires but a few minutes. Therefore, for this purpose, there is needed—

2. *A solution of sesquichloride of iron* of known strength. This may be made, according to FRESENIUS, by dissolving in hydrochloric acid and chlorate of potash 10,03 grammes of pianowire, corresponding to 10.00 grammes of pure iron, and diluting to a liter. For each test of the standard 10 C. C. of this solution is taken, which contains 100 mgm. of iron.

3. In order to note the end of the reduction accurately, a solution of sulphocyanide of potassium is used, as has already been said; a few drops of this are added to the solution to be titrated, causing the well-known blood-red color. It is, of course, not necessary that this solution should contain a known amount of this salt, yet it will be found better to use about the same strength at all times, as will be seen later, since the presence of too much sulphocyanide makes the reaction less marked. I generally use a ten per cent. solution, but this is quite at will.

In performing this volumetric determination of iron there are but few rules to be observed. It is advisable that the solution to be treated be quite acid and very dilute before it is brought under the burette. A solution that contains 100 to 200 mgm. of iron should be diluted to 500 C. C. or more. This is not absolutely necessary for the success of the method, but the changes take place more clearly than when the solution is strong.

In adding the sulphocyanide there must also be some care taken, for if too much is added to the iron solution, it is true, a deeper blood-red will be obtained, but the unpleasant event may take place, especially when the copper solution is added too quickly, that a difficultey soluble sulphocyanide of copper separates, clouding the solution and redissolving with trouble. It is quite sufficient when four or five drops of the above-mentioned solution are added. Then, by dropping in the copper solution the bleaching takes place with extraordinary sharpness, and only when all the iron has become a protoxide the next drop causes a permanent cloudiness.

It is desirable that the iron solution, reduced by means of the dichloride of copper to protoxide should be again brought back to sesquioxide by a solution of permanganate of potash, so that there might be a controlling assay.

This is, however, impracticable, because the hydrosulphocyanic acid is changed by the permanganate of potash into hydrocyanic and sulphuric acids, and thereby a greater amount of permanganate is used. There is also quite an amount of hydrochloric acid in the solution, that causes a farther destruction of permanganate and gives equally false results. If the indicator is iodide of potassium, instead of the sulphocyanide, and the precipitation of diniodide of copper be taken as the sign of the completion of the reduction, there is a decided smell of chlorine when the opposite titration with permanganate is made and too high results are obtained.

The presence of colored metallic compounds, as salts of cobalt, nickel and copper, do not in the least hinder the recognition of the reactions, if the solution is properly dilute. Neither does the presence of arsenic acid affect the process, since this is not reduced by sulphocyanide of copper. This process, therefore, is important to the metallurgist, who is often compelled to determine quickly and correctly the amount of iron contained in a matte, or speisse, or other product. By the above process this is possible in an hour.

Steam Ferry Boat Across the English Channel.

THE *London Engineer* contains diagrams of the new ferry boats intended to bring railroad trains across the channel from and to the French coast. They are on the American plan, similar to those that have been in use for several years for transporting the trains across the Chesapeake Bay on the railroad from New York to Washington, also on the Lake Shore route from New York to Boston, on the Connecticut river, and lately at Parkersburg, W. Va., along the Ohio river. But, as is customary with our English cousins, they make use of our inventions, ignoring their true origin. The vessels are to have a length of 450 feet, deck 57 feet wide, distance between paddle boxes 80 feet. The engines are disconnected, and have a numerical horse power of 750 horse each. The ferry boats, on reaching the stations, will be received in a covered dock, where the train it has on board is run on a pier. The baggage and freight wagons in the hold, in the progress of which, time is of less importance, are to be hauled up the wagon incline at each end, by means of hydraulic capstans, to be constructed by Sir W. ARMSTRONG & Co., who have been consulted on this and the cognate branches of the project.

Though this passage will be so short, the different cabins, arranged as noted in the plan, are to be sumptuously decorated and supplied with the view to every comfort. The total expenses of the enterprise are estimated at about two millions sterling, and it could be worked within two years from the commencement of the works, though the harbor works would perhaps take three years to complete. Besides the greatly increased passenger traffic, from the diminution, at least, of the chances of sea-sickness, the additional practical results expected are a saving in distance of more than three miles in the sea voyage, and of nearly seventeen miles in the whole journey; so that at least two hours in all would be gained, partly obtained by a greater speed in crossing the Channel, partly by the reduced distance, and more especially by the time gained from the conveyances for the travellers and luggage not having to be changed.

Innumerable plans have been put forward at different times for crossing the Channel with greater speed and with less discomfort than is felt in the little steamers at present employed. A bridge, the work of many years, and to cost at least fifty millions, has been proposed. An underground tunnel would be, perhaps, more feasible, but it is also liable to the important objections of costliness and of slowness of construction. The practical feasibility of any new plan is generally inversely as its probable cost; and it is this feature of moderation and common sense that gives the greatest chance to the actual carrying out of Mr. FOWLER'S plans. Assuredly few, in these times, will be found willing to begin to pierce a tunnel or to lay down a bridge to be enjoyed, at the best, by the next generation.

The success of this enterprise is chiefly guaranteed by the results obtained from our experience. It is thoroughly an American system of transporting railroad trains across the water, and we believe can be claimed as an invention entirely originated by American engineers more than twenty years ago.

The New Engine for the Brooklyn Waterworks.

BROOKLYN boasts of a great many large and fine things. Her park, her water supply, her great well, and now her great pumping engine, the largest on this continent, and probably as fine a machine as has ever been built for this purpose in the world. The engine-house at Ridgewood is designed to hold four engines of some four hundred horse-power each. Two of them were built at the beginning in the years 1858–9. These engines, though working steadily and well for ten years or more, have not proved as economical in fuel as was expected, and it was decided to build the third engine upon the fly-wheel system, and in place of having two force-pumps thirty-six inches in diameter, one at each end of the walking-beam, only one double-acting pump was placed directly under the steam cylinder. The dimensions of this pump are fifty-one and a half inches diameter and ten feet stroke. The pump is peculiar, and known as the "Thames Ditton," or plunger and bucket pump. One of this kind was first built in England, and introduced, in 1848, by David Thompson, at the Richmond and Bristol waterworks, and the Lambeth and Cork waterworks. Similar pumps, built in Montreal, are now also in operation at the Toronto and Hamilton waterworks, Canada.

In the pump of the Brooklyn engine No. 3, however, an improvement on the above has been effected by the addition of an auxiliary barrel and annular waterspace, which facilitate the water passage and give more valve opening. This improvement is due to Mr. W. WRIGHT, the designer of the other engines.

The engine is built on a solid foundation of granite, upon which are bolted the bed-plates, with bolts varying from two and three-quarter to five inches in diameter, and projecting about ten feet into the masonry. Upon these bed-plates is bolted the framing of the engine, which consists of two central columns twenty-five feet high, each weighing about fourteen tons, connected with a cast-iron net, and braced by four diagonal columns, which are bolted to the central columns and bed-plates by bolts, four inches in diameter and thirty feet long, passing through their centre. Upon these columns are bolted the beam pillow-blocks, upon which vibrates the beam, which is thirty-one feet long, and weighs thirty tons, the beam-pin being eighteen inches in diameter. The whole of the upper work is surrounded by a gallery, which is similar in style to that of the other engines. The steam cylinder, which is eighty-five inches in diameter, and has a stroke of ten feet, is bolted to the bed-plates by four-inch bolts, and surrounded by a steam jacket, filled with live steam. The piston-rod is nine inches in diameter; the upper end is connected by means of a cross-head with the parallel motion and main links, which are six and three-quarter inches in diameter and six feet long, and connected to end centre-pin of beam, which is nine inches in diameter. Upon the opposite side of the beam is the rod, twenty-eight feet long and eleven inches in diameter, connected to the fly-wheel shaft, which is twenty inches in diameter, by a wrought-iron crank. The fly-wheel, twenty-six feet in diameter, was made in ten segments, and weighs thirty-six tons. Upon the same end of the beam, and connected by links about thirty feet long, is the air-pump, which is double-acting, thirty-six inches in diameter, and has five feet stroke. The pump, which is placed in a well directly under the cylinder, is connected to the lower end of the piston-rod, projecting through the cylinder bottom, and coupled to the pump-rod in the plunger by a coupling of cast-iron, bolted together by four four-inch bolts.

The plunger is thirty-eight inches and bucket fifty-one and a half inches in diameter; the latter has a double beat composition valve, forty-four inches in diameter, and weighing five hundred pounds. The outside barrel of the pump is seventy-three inches in diameter. The foot-valve chamber is eighty-nine and a half inches in diameter, and contains twenty composition disc-valves, weighing sixty-five pounds each, and placed over openings of eleven and a quarter inches diameter. There are also thirteen of these valves placed over the annular water space, which work with the large bucket-valve. The height from the centre of the beam to the bottom of the pump is sixty-three and a half feet. The air-chamber has an internal diameter of six feet, and is thirty-five feet high, fitted with a check-valve, containing thirteen disc-valves.

The action of the pump is as follows:

The piston or bucket being raised, lifts the foot-valves, and the pump fills with a capacity of fifty-one and a half inches diameter and a stroke of ten feet. Down stroke: Plunger while descending forces the water through the thirteen valves placed over the circular space, the bucket-valve or large double beat-valve being lifted at the same time, and allowing the remaining column of water (fifty-one and a half inches diameter—thirty-eight inches diameter) in the working-barrel to pass through. Up-stroke: Bucket-valve is closed, and lifts the column of water which has passed through it in the down-

stroke, at the same time lifting the twenty foot-valves to fill again the working-barrel.

This pump delivers, through a thirty-six-inch force-tube, a constant stream of water into the reservoir, a distance of three thousand four hundred and fifty feet, and a height of one hundred and sixty-six feet. The flow of water delivered into the reservoir is perfectly even.

The valve gearing of this engine consists of an adjustable full stroke cut-off, designed by Mr. A. J. L. LORETZ, the constructing engineer, and is a fine piece of mechanism and workmanship, for which the builders, Messrs. HUBBARD & WHITTAKER, deserve much credit.

The figure given on the lower part of this page represents a portion of the cut-off. There are two steel lifting-rods for working the steam valves, and two sliding cast-iron yokes for working the exhaust-valves, which slide in composition bushings on the lifting-rods.

The action of the cut-off is as follows:

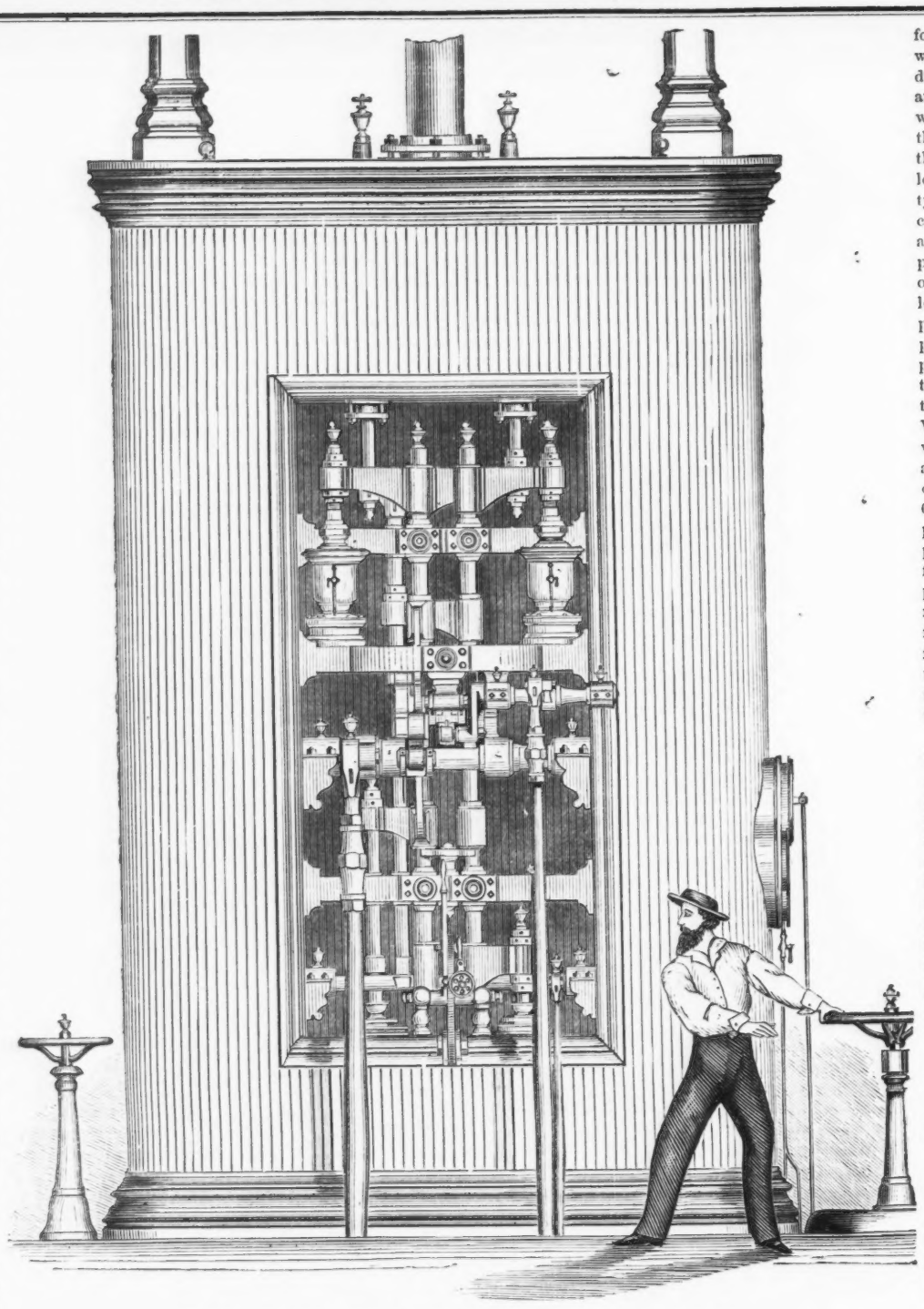
The roll lever, U, on main rock shaft lifts yoke, B, which slides on lifting-rod, A, and raises with lifter-arm, B^2, the exhaust-valve. The sliding block, H, which slides forward and backward in the yoke, and the movement of which is similar to that of the piston, (reduced; the cut represents the position at end of stroke) strikes the tappet, P, of arm, E, which is connected to the lifting-rod, A, and raises the steam valve with lifter-arm, C; the block, H, moving from under the tappet at that moment, and keeping the rod up until the block, H, leaves the tappet, P, which then drops, cutting off the steam. The descent is eased before the valve reaches to within one-quarter of an inch of the seat, by a dash-pot, D; through the first three and a half inches the valve drops rapidly. The sliding block, H, receives its horizontal motion from a cross-head, S, having a projection fitting into a vertical groove in the block, H, with which it slides up and down on the cross-head, S, when lifted by the roll-lever. The cross-head, S, is connected to a sliding link, F, by a connection, S'', with the centre of a brass lock, V, sliding up and down in the link. The link is coupled at the lower end by a connection, T, to an L-crank, receiving its motion from an eccentric, set with the stroke of the piston. The link and cross-heads, S, slide together on steel slides, G.

Now if the block, V, connecting the cross-heads, S, is raised in the link, F, to its highest point, the block, H, will be drawn closer in under the tappet, P, by means of cross-heads, S; it being so regulated that it will just have left the tappet when the roll-lever leaves the yoke and the stroke is ended; consequently the steam has followed up full stroke in the cylinder. Now if the block, V, is moved down to W, the lowest point of the link, F, the connection, S'', will throw the block, H, from the tappet, P; at the moment the block wants to strike the tappet to lift the steam valve, it begins to move from it; the engine consequently takes no steam. The block, V, is connected by means of a strap to a hand-lever and adjusting screw, by which the engine is regulated when running.

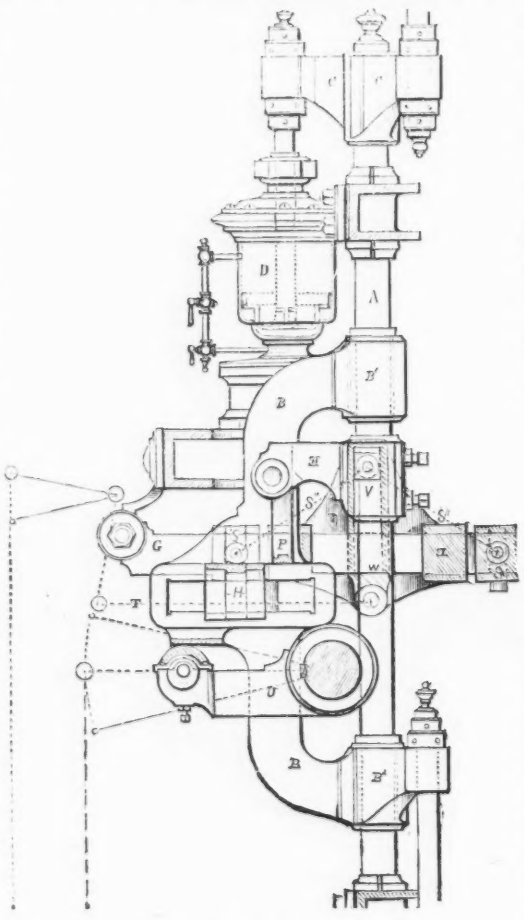
Now, it is evident that if the block, V, is moved between any of the above-mentioned places, the steam will be cut off sooner or later in the course of the stroke of the piston. Mr. LORETZ proposed to attach a steam regulator to the cut-off, adjustable so that the engine would regulate itself to run at any desired speed.

There are five drop return-flue boilers, seven feet in diameter and twenty-four feet long, used for this engine; they were also manufactured by the builders of the engine.

The engine here described has been completed at a cost of $130,000, by Messrs. HUBBARD & WHITTAKER, of Brooklyn. The whole engine is represented in our large engraving, which, however, gives only a faint idea of its collossal size. About two-thirds of the engine are under the floor of the engine-room, yet even the part exposed to view when entering the place is of strikingly large dimensions. It is now in daily operation, and the results far surpass those obtained by the old engines. The power required by contract was four hundred horse, not estimated nominally as indicated by diagrams, but as shown by labor performed, namely, by the amount of water actually discharged into the reservoirs; four hundred horse-power are equivalent to over 13,000,000 foot-pounds per minute, or nearly 800,000,000 per hour; or, in forty-eight hours, 40,000,000,000 foot-pounds in round numbers, which, for a height of one hundred and seventy feet, would amount to 240,000,000 pounds of water or 30,000,000 gallons. For this reason, the contract called for the discharge of 30,000,000 gallons into the reservoir during forty-eight hours; furthermore, the contract required the performance of a duty of 60,000,000 foot-pounds for every hundred pounds of coal consumed, which is equivalent to nearly three and a-half pounds of coal per hour per horse-power. The actual results accomplished by this engine, as reported to the Water Commissioners by the two engineers, Messrs. W. E. WORTHEN and C. W. COPELAND, who conducted the experiments, are as follows: For every hundred pounds of coal used, 72,000,000 foot-pounds have been produced: that is, 72,000,000 pounds of water were raised one foot high, which is equal to 426,000 pounds, or about 50,000 gallons, raised one hundred and seventy feet into the reservoir; so that for every pound of coal consumed under the boilers, the engine throws five hundred gallons of water into the reservoir.



The New Engines for the Brooklyn Water Works—Front of Cylinder.



Valve Motion.

These results are remarkably favorable, if we consider that the consumption of the other two engines is about twice as large, for not quite the same amount of actual labor, and that the boasted economy of the Cornish engines, by late impartial tests in England, is found to have been greatly exaggerated. The latter is now found to be far behind the above results, and even many other engines, formerly not supposed to possess any special advantages, excell it considerably.

The builders of the Ridgewood engine, Messrs. HUBBARD & WHITTAKER, are at present the principal owners of the well and favorably known Burdon Iron Works. These works were established in 1835, on an area of sixteen building-lots. They consist of machine-shop, foundry, boiler-shops, pattern-shops, offices, etc., and can employ four hundred and fifty men. The stationary engines built here are found in many localities, and are favorably looked upon by the public. During the war, the engines and machinery for several light-draught gunboats were constructed at these works. The beam engine for the steamer "Seawanka," known to be one of the smartest vessels in our waters, was also built here.

Both of the above-named gentlemen were educated as practical mechanics, and served their time as apprentices. They organized their firm in 1862, and to successfully carry out so great an undertaking, must necessarily employ large capital.

Who does not admire the triumph of human ingenuity and persevering industry, which in our time is directed toward the benefit of the race, in place of being spent, as in olden times, on useless monuments of vanity and pride? A visit to the Ridgewood Waterworks, and a look at the huge and at the same time elegant machinery, will well repay any one who has the least appreciation of the truly noble, grand, and beautiful. Well may Brooklyn be proud not only of possessing such an engine, but more so of having among her citizens men who are able to accomplish engineering works so eminently successful.

MINING SUMMARY.

Montana.

MINER'S DITCH COMPANY.

According to the *New North-West* the above-named company are constructing a ditch carrying water to Modesty, Richardson, Prairie, Spring and Antelope gulches, which will have the largest capacity of any ditch in Montana. "It has a five and-a-half feet bottom, is seven feet across the top, and thirty inches deep, with two-sixteenths grade, and will carry 2,500 inches of water. Work on it was begun December 6, 1869, and it will be completed in June or July, 1870. It is being built on the joint stock principle by the miners. Twenty-five men have been employed during the winter. The number will be increased to fifty in a few days. Two miles are now completed. Only some seventy-five men could work in those camps last season, owing to the scarcity of water; but, on the completion of this ditch, with a good flow of water, they will furnish employment to a thousand men. It is the judgment of the best miners that these camps, lying in the same range, and possessing the same general characteristics, will develop into camps as good as the Gold Creek and Pilgrim Bar camps, until a year or two since undeveloped, and now among the very best of this or any mining region."

MILL CREEK.

A correspondent of the Virginia *Capital Times* writes favorably of the revival of mining in this locality. "But (he says) the halcyon

days of Brandon were those of 1866. The prospecting of the previous two years had discovered and partially developed some very strong and promising veins of argentiferous galena and dry silver ores, which had attracted the attention of men of means, who showed a willingness to erect machinery upon present developments by doing it, and to-day two smelters, a 10-stamp mill with amalgamating appliances for free gold ores, bear evidence of the confidence then felt, and which we believe time and experience will demonstrate was not misplaced. But owing, it was said, to a want of proper material for lining to resist the degree of heat necessary to smelt the ores, the smelters did not meet the expectations of their constructors, and operations were abandoned. The Smith & Cummings furnace has been dismantled of its blast to supply a deficit in one of the smelters at Argenta, though the structure is otherwise complete, and, with the exception of proper lining, ready for work. This furnace, when running, worked ores from the Great Western lode, which is still believed to be rich in silver, notwithstanding it has been allowed to remain so long idle. The Livingston furnace has been newly lined with fire-brick obtained from the kilns at Argenta, which have stood two runs without perceptible injury, and promise good service for the future. This furnace is in complete repair, and will be started up on Monday on ore from the Lebanon lode, if the depth of snow in the cañyon will allow of the delivery of coal for that purpose. The ore is on the ground and everything prepared, if this difficulty can be overcome. The Branham 10-stamp mill—water power—is in complete running order, but will probably not be started up before June, as Mr. Branham has gone east to procure pans, which will be attached before a wheel is turned, as the difficulty heretofore has been to save the metal with plates and blanket riffles. Ores from the Branham lode worked in this mill yielded from 50 cents to $1 50 per ton, while the same character of ores worked in Bradley & Branham's arastra, taken clear across the lode, twenty feet wide, never yielded less than $11 to the ton, while a slight selection has raised the yield to $60 per ton. Messrs. Bradley & Branham will start up their arastra as soon as the weather will permit on ores from the Kit Bullard lode, from which a yield of from $50 to $75 to the ton is confidently anticipated with very slight selection. Whittaker's 3-stamp mill, seven miles above Brandon, at Quartz Hill, will be started up soon on ores from the Home Stake lode, which is said to be very rich in gold, and of a general character to fully justify more extensive machinery."

THE CEDAR CREEK MINES.

We copy the following from the Idaho *World*, as perhaps as intelligent a view of these new mines as any yet published: "We are indebted to Mr. Robert Boyd, of this city, formerly of Montana, for a copy of a letter written by John H. Ming, Esq., of Helena, Montana, who had just returned from the Cedar creek mines, and from which we condense a few items of interest. When Mr. Ming arrived at the junction of Cedar creek and Oregon gulch he found several hundred men, who were busily engaged in building up a town. About thirty miles of Cedar creek and Oregon gulch was already located and recorded, and prospecting was going on actively in Oregon gulch; but the time he left—about the middle of January last—no paying prospects had been found. About fifty miles of side gulches had been recorded. Mr. Ming spent some time at Louisville, on Cedar creek, which appeared to be a thriving little camp, and he states that there are some good mines there. The district had been prospected for six or eight miles, and generally good prospects were found, some of the claims seeming to be very rich. He knew of 40 cents and $1 10 to the pan; others five and ten cents, and many nothing. He says: 'I am inclined to think that we hear of all the large prospects, while the hundreds of pans in which very little is found are unheard of.' It is thought that the mines are very shallow and will be rapidly exhausted, rendering the camp a short-lived one. All the claims are laid over until next June. Many of the stampeders to the Cedar creek mines suffered intensely from the cold, some of them having their feet frozen, and one man nearly lost his life. Mr. Ming's account is undoubtedly a fair one, and can be relied on."

California.

GREENHORN MINE.

The Grass Valley *Union*, March 6, has the following account of this rising mine in Nevada county: "The Greenhorn Mining Company commenced work on the face of the tunnel, which is now into the ledge, on the 4th day of January last. At that time there were seventy-five feet of stopes. A main drift has been run since then 160 feet—the drift is 50 feet to the South and 110 feet to the North. The stope at the northern boundary has increased to 190 feet in depth. The ledge is four feet thick on an average, and at times increases to a size of from six to eight feet. All the vein matter between the walls is taken to the mill and crushed. In February the mill commenced crushing, and has run twenty-two days, reducing 320 tons of ore. The yield is gold in bars valued at $6,000, with sulphurets saved and specimens valued at from $1,500 to $2,000. During the last ten days one of Knox's pans has been run on the tailings, which have been concentrated and saved in vats. From these tailings 130 ounces of amalgam were extracted. The company have about four times as much tailings saved as they have worked, and are putting in two more pans, three at least being required to keep up with the mill. The expenses of the mine, for the months of January and February, including the running of the main drifts, have been $1,608. Four men, on a shift, keep the mill supplied all the time with ore. The rock can be mined and milled at a trifle less than $6 per ton, which gives a clear profit of $20 per ton on the rock reduced. The Greenhorn mine is no doubt permanently good."

THE MINING EXCITEMENT AT SAN DIEGO.

Dispatches from Los Angelos, dated March 6, contain the following, which our readers would do well to believe slowly: "Intense excitement prevails at San Diego, created by the apparently well corroborated evidence of the discovery of rich gold mines in that vicinity. The exhibition of twelve hundred pounds of rock brought in from the George Washington ledge seems to have started the big rush to the new mines. The quartz taken out is free from sulphurets or other metal, and is spangled and literally full of free gold. The half ton shipped to Rountree & McMullen, San Francisco, will yield from one to two thousand dollars, at a low estimate. The George Washington is located forty-four thousand feet, and runs nearly east and west, and two to four feet wide. In the talcose slate formation at the surface there was found rich, decomposed rock, following the lead from which some dust was extracted, which went up on to-day's steamer. Two other locations were made, which take up in all about two miles. On this lead a district has been formed, called the Julian, which is situated two and-a-half miles from the mining camp of Coleman district, near the summit of the ridge forming the water shed between San Diego valley and the desert. The distance by the road from San Diego valley is sixty miles. The district is well wooded and watered, and of easy access. Some of the latest reports, which are reputed as vouched for by parties from San Diego, are that a company of Chinese have struck a ledge much richer than the George Washington, and that nuggets have been taken out, weighing one or two ounces. A sensational story is told of one man pounding out between four and five thousand dollars with a common mortar. In the Washington, prospected down six feet, was found silver ore as well, and old miners compare it to the Comstock, being rich in gold at the surface to excess, and the silver increasing as they go down. Influential citizens of San Diego endorse the richness of the newly discovered mining district, and a strong company will be incorporated at San Francisco. At present there are from one to two hundred men on the grounds, and one hundred and fifty left San Diego on Saturday. More will leave daily, and lively scenes in holding claims are looked for. About fifteen miles are now said to be located in the district."

REVIVAL OF MINING.

The San Francisco *Bulletin* says: "It is evident from the reports that reach us from every part of California that a fresh stimulus has been given to the discovery and working of mineral lodes in our own State. For some years past California mines had been neglected for the new fields in adjoining States and Territories, where, if the inducements to invest labor and money have seemed more brilliant, the difficulties and reverses have been much greater. Even in as well explored a district as that about Grass Valley, extensive locations have but recently been made on new ledges. From Siskiyou to San Diego we receive reports of important discoveries. The San Diego development seems to be particularly rich, though it is well to receive the first glowing accounts of it with caution. Should they be confirmed we may expect one of those 'rushes' that have been characteristic of our population. This, while it would injure many persons would open to others better opportunities and would relieve the city of some of its surplus of laborers, thereby lessening the amount of want and vice.

"There is one favorable peculiarity about the gold ledges of California. They can be worked with far less expense than silver lodes. The old saying is nearly true, that it takes a gold mine to work a silver one. A far less per centage of metal will work to a profit in our quartz ledges, than in the argentiferous lodes of Nevada; the ores are simpler, the rock more easily obtained and crushed, while timber and water are more abundant, and the situation of the lodes more convenient to centres of supply and business. With greater economy and system we shall yet work to a profit as low grade ores as are crushed in Australia, where an average of $2 to $6 per ton is made to pay dividends under favorable circumstances, Legitimate mining, if not so essential to the prosperity of California as of old, is very desirable and important. In one respect its value is greater, for it contributes directly to build up manufactures. Its decline during the past two years, consequent upon reverses caused by speculation and extravagance, has much depressed some leading manufacturing interests and thrown numbers of mechanics out of employment. Prudent development of mines within our own State, with a view solely to returns from ore honestly worked, will give new life to our foundries and workshops, while it arrests the decay of many old mining localities. Hence the reports of discoveries throughout the State must be regarded with satisfaction, which is increased when we reflect that they may be the means of directing to wholesome channels some of the energies and means lately given too exclusively to speculation in land and other unproductive operations. If we can increase the coal and add iron mining to gold, so much the better—and there are some grounds for expecting this also."

THE NEW SAN DIEGO GOLD MINES.

Advices by way of Los Angeles, dated March 11th and 13th inclusive, report as follows: "The cold weather the past two days has deterred parties leaving for the mines. From the county of San Bernardina and every part of San Diego the rush is starting for the new diggings. San Juan Capistrano is nearly deserted. Near Anaheim a large party has gone. Quartz has been brought into Anaheim in pieces fully one half pure gold. The great extent of the district, it is thought, will start an unprecedented rush from all parts of the State. Low estimates give the number of men in the mining districts at 800, of whom about 600 are from San Diego. Placer miners find pay dirt, but with no big results; they are working with rockers; the gold seems to be washed from the quartz leads which are rich and extensive. With the present large force on the ground it is believed the placers will soon be worked out. Prospectors in the vicinity are abundant, and leads are said to be traceable for miles, with decomposed rock on the surface, from which gold is easily extracted. The wide range of the district renders it impossible to give the results obtained. Many rich discoveries are said to have been made, which are kept secret. This afternoon men in charge of a drove of Texas cattle came in direct from the mines, and brought some rock from the George Washington, taken at random. It confirms beyond doubt the richness of the quartz as far as sunk (some six feet), and similar rock is found in the San Diego and Melchor claims, all as yet undeveloped. As high as two dollars to the pan has been taken out near the Washington lead. A large party of Chinamen, working rockers, make from two to six dollars per day in the foot-hills and at the head waters of the San Diego. Wagons and stages are running to the mines from San Diego, a distance of sixty-five miles, and make very slow time—two to three days, and charge six dollars. The prospecting for leads by parties spreads for forty miles or more. The nature of the country indicates a rich mineral region. But little work is being done at the Washington and other leads other than preparatory. The morning stage brought the first party from San Francisco. Major Wright, special correspondent of the *Alta*; J. H. Atchinson, A. C. Hamilton, Geo. P. Harte and M. A. Lewis, of San Francisco, leave for the mines to-morrow. A party from here also leave, among whom are C. A. Luckhardt and Dr. J. B. Winston, owner of the La Patra silver mine."

LETTER FROM A CORRESPONDENT.

The San Diego correspondent of the *Bulletin*, under date of March 18th, writes as follows: "There is no 'let up' to the dry season, and in addition we are having cold, frosty nights, more severe than most of our winter weather. It tried very hard to rain all last week, but could not make the riffle. People have generally made up their minds for a drought, and take it as a matter of course. I think a great many squatters are well satisfied that they have no crops to look out for, as their whole attention can now be given to mining, which is on the brain of most of the population of this county. Before this reaches you the quartz rocks of Messrs. Gower and others will have arrived in San Francisco and produced a sensation. I was present when the wagon with the half ton or more of gold-bearing quartz reached its destination in New San Diego, and it was a sight worth looking at to see the people rushing for a look at the precious stuff. Within an hour after the arrival of the 'rocks' every vehicle which was obtainable had been engaged by parties eager to locate in the new El Dorado. The discoverers said there was any quantity of the same kind of country to prospect in, plenty of ledges, and plenty of grass, wood and water in the vicinity. From present prospects, there seems to be no doubt of the existence of rich quartz mines and plenty of paying diggings in this county, which should no longer be classed among the 'cow counties.' Since the arrival of the quartz of Messrs. Gower and others the two San Diegos are being depopulated at a rapid rate, goods of every description are being sent forward, and business looks up wonderfully. On Monday a rich specimen was brought to New San Diego, about a foot square, the value of which was variously estimated at from $150 to $600. This, of course, did not lessen the enthusiasm of the people, who are really going mine-mad. National City is left without population, and if our friend Hortus is able to finish his huge hotel in Newton, without importing a fresh lot of workmen, he will be lucky. It is reported that Chinamen are being driven from the newly-discovered mines, and also that a fight had already taken place in consequence, several Chinamen and others being killed. I should not wonder if something of the kind occurred, as the Democratic element is very prominent among the miners. The County Court is in session this week, and I learn that the trial of the killers of Capt. Gregory's cow is again to come off. Whether there will be as much of a farce as at the former trial remains to be seen. An example should be made in this case, where the guilt is admitted, for this killing and maiming of stock has gone far enough. The Arguello family, residing at La Sunta, some ten miles or so south of Newtown, have had at least two hundred head of cattle killed and wounded within a year. Of course the owners can obtain no redress, as the killing and maiming cannot be proved; but it is a bad state of things. The extra family flour of the new flouring mill is pronounced by competent judges to be all that the name indicates. We use it at home, and find it a very superior article. Lumber is down to $20 and $25 per 1,000 feet for rough fencing and other lumber. I hope it will keep down till fencing time comes round, so as to give poor people a chance. Among the recent arrivals at this port are many people pretty well advanced in consumption, who seek this climate as a last resort. Many who came here six or eight months ago are much improved in appearance, and give the climate some of the praise it deserves. When the commodious hotel is in running order, with its hot and cold baths and other luxuries, I trust that the wants of all invalids seeking health and comfort will be supplied. The firm of Whaley & Crosthwaite have given up business in Old San Diego, and are fitting up the first floor of Horton's Hall, where they will hang out in future. 'One by one the leaves are falling' from Old Town, and the old place begins to look desolate. Nothing will be left there in a short time but a few saloons and lawyers, with the officials, who of course cannot leave."

Nevada.

REDUCED TO A CERTAINTY.

We have learned, says the Austin *Reveille*, the general results of the working of a couple of tons of the characteristic ore produced by the best mines of Lander Hill, which had been sent to the Auburn mill at Reno to be chloridized in the Stetefeldt furnace. The result is a brilliant demonstration of the success of the patent process, and has removed every vestige of doubt. The only doubt that existed in the minds of well informed millmen and others, arose from the fact that the ores of Lander Hill are principally antimoniates of silver; and, although the ores are classed generally as chlorides and sulphurets, the latter contain only a small per centage of sulphur. But the test at the Reno mill, which was conducted by Mr. Stetefeldt, the inventor of the process, was thorough and complete, and has reduced the success of the new furnace to a certainty. One of these furnaces will be built immediately at the Manhattan mill in this city, and as this is regarded as the representative silver district of the State, its successful working will give a permanent prestige to the process. We predict that, sooner or later, the Stetefeldt chloridizing furnace will be the chief agent employed in beneficiating the silver ores at least of all our States and Territories.

AFFAIRS AT WHITE PINE.

From the *News* of March 7th we clip the following: "The intermittent storm of the past week greatly retarded matters, more by discouraging those about to commence work on hitherto idle mines than by any actual check to active operators. We noticed on Friday morning a number of mines about being opened on foreign capital; this class of owners are more particular about the season than those who have resided here for a year or two, and the return of storms after the fine weather of February is likely to deter them from commencing as early as they intended. However, a large number of mines, both base and free, have been started up—more especially of the latter class, most of which are located on Treasure Hill. In consequence of this there is a noticeable improvement in the local business of Treasure City. English capital is seeking investment here, and a representative engineer is expected daily, to make examination of several leading mines on Treasure Hill, with a view to purchasing them in bulk. Five leading mines are included in the negotiations, and the price agreed upon goes well up into the millions. Our bullion shipments for the past week show a considerable falling off from the week previous, aggregating but $19,130 65—of which $10,559 32 went West, and $8,571 33 East. The shipments for February foot up $111,901 33—of which $60,843 57 went East, and $42,057 82 West. Excess over shipment for January, $6,465; and over a corresponding period of last year, $70,243 96."

Idaho.

FROM LOON CREEK.

The annexed is from the *World* of the 3d ultimo: "Mr. Charles Shepherd's Loon Creek Express Messenger, accompanied by H. H. Knapp, returned from Oro Grande, via. Deadwood Basin, on the evening of the 27th of February. He was nine days going out the last trip, and eight days coming in. There are now at the Loon Creek camp about 250 men, nearly all of whom are actively stirring about, working and prospecting. Slocum, M. Callahan, a German, and eighteen Chinamen are wintering in Deadwood Basin. In Stanley's Basin nine men are winterng. Shallow diggings pay well there. On Robeson's Bar, on Salmon River, twenty miles below Stanley's Basin, are drift diggings which pay very well. They are on a direct trail from Idaho City to Salmon City. These diggings paid some $5,000 last fall."

Indiana.

Prof. Cox, in company with three or four gentlemen interested in coal, recently visited the coal veins near Carbon, Clay county, Indiana, on the line of the new St. Louis railroad. He reports a fine quality of coal easily accessible by a switch from the road. Several new blast furnaces are to be erected at Carbon.

Lower California.

A La Paz letter dated Feb. 18th, says the mines and works of the old Triunfo had been transferred to a new company, and that machinery to work the rich mines of Mendosina had been shipped; also, machinery for the Codicia mine and the reduction works.

MARKET REVIEW.

The Coal Trade.

NEW YORK, April 2, 1870.

WHOLESALE.—The strike in the Schuylkill region, opening of canal navigation, and the eighty-first Scranton sale of 80,000 tons, were the main topics of conversation in coal circles during the past week. The advance on the price of coal at Wednesday's sale took no one by surprise, and we clearly hinted at the fact in our last issue. The question now under consideration is, what effect will the advance obtained have on the miners and operators in the Schuylkill coal region?—whether the demands of the men will not be acceded to and operations resumed? While the general advance in the price of coal may admit of such a course, we hardly think that these prices can be maintained, and that the miners are merely putting off the evil day for at best a few weeks. Coal must recede in price, if only in sympathy with the decline in gold and everything else, and the sooner the miners become convinced of this fact, the better it will be for all parties interested in the trade. The liberality with which the Philadelphia and Reading Railroad has stepped forward to assist Schuylkill county to hold her position in the great coal markets, and the willingness of the operators to sacrifice their share to the same object, should convince the miners, in or out of their association, that there is a necessity for them to lend a helping hand in the same direction.

Since the decline in gold everything in the way of the necessaries of life, that the miner needs, has greatly diminished in cost, and in endeavoring to maintain a position in opposition to this general shrinkage in values must only eventually tend to his discomfort. That the present prices asked for coal in this market to-day are too high, every dealer admits. Yet they claim that prices are as low as the commodity can be offered at the present rate of wages, or, in other words, working on the "basis of 1869." Schuylkill county out of the market, the prices can be maintained; with Schuylkill at work, and sending us 300,000 tons per month, they must break.

Now, then, is it not plainly evident that the miners in their stubbornness are only giving a helping hand to the great companies in the Lehigh and Wyoming regions, who are endeavoring to get sole control of the market. In order to save Schuylkill county from being entirely shut out from the great market here and the East, she must, if anything, be able to produce coal cheaper than the other districts, in consequence of her greater distance from tide-water; and every department of the production, preparing and transporting of coal in that district, should contribute its quota to that end.

Therefore we would not advise the miners to have too much confidence in the present prices of coal, but to come to an arrangement with the operators for the future salvation of Schuylkill county.

Below will be found our report of the Scranton sale mentioned above, compared with last month's sale and for the same month, 1869.

AUCTION SALE OF COAL—ADVANCE IN PRICES AND A FIRM MARKET.

The Delaware, Lackawanna and Western Railroad Company at noon on Wednesday, 30th, sold 80,000 tons of Scranton coal at auction, through John H. Draper, auctioneer. There was an unusually large attendance, and considerable competition. There was an advance on all sizes, and the market was firm. The following shows the prices obtained, with a comparison of the prices realized at the last sale:

1870.			March 30.	
10,000 Tons	Lump	$4 32½	@	4 27½
12,000 "	Steamboat	4 40	@	4 35
13,000 "	Grate	4 60	@	4 50
10,000 "	Egg	4 80	@	4 65
25,000 "	Stove	4 50	@	4 45
10,000 "	Chestnut	4 40	@	4 30
80,000				

1870.			Feb. 23.	
8,000 Tons	Lump	$4 15	@	4 05
12,000 "	Steamboat	4 17½	@	4 02½
12,000 "	Grate	4 20	@	4 05
10,000 "	Egg	4 22½	@	4 17½
26,000 "	Stove	4 87½	@	4 67½
12,000 "	Chestnut	4 00	@	3 90
80,000				

1869.			March 31.	
12,000 Tons	Lump	$4 30	@	4 37½
14,000 "	Steamer	4 45	@	4 47½
15,000 "	Grate	4 45	@	4 50
9,000 "	Egg	4 62½	@	4 65
20,000 "	Stove	4 85	@	5 05
10,000 "	Chestnut	4 30	@	4 42½
80,000				

The above record shows an average advance of 41 cents on the sale of last month, and an advance of only six cents for the month of March, 1869.

The Pottsville *Miners' Journal* gives in its last issue what it claims to be the correct prices, of Pittston Coal for the month of April—which are apt to mislead the public, and at best must prove an injury to Schuylkill county. The Pennsylvania Coal Company has always been a "bear" in the coal market, and we doubt not but that they think they have played their point nicely in having the above-named prices quoted. The following is their prices taken from their official circular, dated April 1st, and forwarded to us yesterday: Lump, $4 50; Steamer, $4 50; Grate, $4 55; Egg, $4 60; Stove, $5 25; Chestnut, $4 40. The above are the Newburgh prices—70 cents additional for delivery at New York.

The Lehigh Coal Exchange met three times yesterday and finally agreed upon the following prices for April: Lump, $5 50; Broken, Egg and Grate, $5 25; Stove, $5 50; Chestnut, $4 75—this is an advance of 25 cents all around. The Wilkesbarre Coal and Iron Company issued a circular on Thursday, bearing the following prices for April: Lump and Steamer, $4 75; Broken, $4 85; Egg, $5 25; Stove, $5 75; Chestnut, $4 75. We failed to find "why" they ask 25 cents per ton more for stove sizes than the price fixed by the Lehigh Coal Exchange, but suppose the reason is that stove coal has been and is very scarce; it may, however, be its "superior quality" that demands the difference.

The Old Company's miners not being at work, we have no quotations from them for April.

The Delaware and Hudson Company's prices for April will be noted in our next issue; they will probably be a shade higher than the Pittston Company.

RETAIL.—For family uses the demand has been good, and prices have not advanced. We quote Pittston, Lackawanna and Scranton at $5 50 to 6 50; Lehigh, $7 50 to 8 00.

FREIGHTS.—Vessels are in good supply. We quote Boston, $1 90; Philadelphia, $1 20; New Haven, $1 00; New York, 50 cents from Elizabethport.

Our Philadelphia correspondent thus notes the market: There is not much demand; some few orders have been taken at an advanced price. The mines will all stop on Saturday, and the general impression on the street is that the operators will hold out. If they accede to the demand of the men, coal will be cheaper by the 1st of May. Very little coal is coming down; the demand on the line is taking up all of the stove coal. Freights to Boston $2 40 to $2 50; New York, $1 20 to $1 25.

Anthracite Coal Trade for 1869 and 1870.

The following table exhibits the quantity of Anthracite Coal passing over the following routes of transportation for the week ending March 26, 1870, compared with week ending March 27, 1869.

COMPANIES.	1869. WEEK.	1869. TOTAL.	1870. WEEK.	1870. TOTAL.
*Phila. & Reading R.R.	69,293	632,025	64,356	652,367
Schuylkil Canal	17,283	24,134	1,124	1,640
Lehigh Valley R. R., N. " S	46,087	659,006	6,7.6 66,125	70,112 129,626
Lehigh and Sus. R. R.	18,656	207,726	26,636	210,545
Lehigh Canal				
Scranton North	9,734	117,867	13,125	141,311
" South	29,635	354,012	37,174	370,060
Penn. Coal Co., rail	7,680	157,000	19,770	207,305
" canal				
Del. and Hud. C., rail, N. " " south			12,113 10,617	133,346 4,380
Shamokin				
Trevorton	5,072	75,861	6,107	61,514
Lykens Valley Coal Co.	523	4,909	2,567	6,300
Wyoming South	1,200	9,823		
" North				
P. N. Y. C. & R. R. Co.	10,811	160,732	6,736	70,590
Williamstown, Cof'y	3,828	26,139	6,123	50,645
Short Mountain	2,109	11,040		
Total	221,293	2,501,174	284,309	2,753,839
1870			221,296	2,501,174
Increase week and year			63,013,	252,765

* Less coal transported for Company's use and Bituminous coal.

Bituminous Coal Trade, 1869 and 1870.

The following table exhibits the quantity of Bituminous Coal passing over the following routes of Transportation for the week ending March 26, 1870, compared with week ending March 27, 1869.

COMPANIES.	1869. Week.	1869. Year.	1870. Week.	1870. Year.
B. & O. R. R.			6,119	59,614
C. & O. Canal				
H. & B. T. R. R.	5,661	68,886	6,028	52,020
Harrisburg & D.			10,117	113,145
L. V. R. R.	552	552	982	4,292
P. & N.Y. C. & R. Co.			4,271	48,830
	6,213	69,438	27,517	277,891

Schuylkill Coal Trade.

Report of Coal transported via the P. and R. R. for the week ending March 24, 1870—less coal carried for Company's use, and Bituminous Coal:

For week	69,355 13
Previously this year	583,011 04
Total	652 366 17
Same time last year	692,025 00
Decrease	39,658 03
Amount sent same week 1869	69,283 00

Report of coal transported on the Philadelphia and Reading Railroad for the week ending Thursday, March 24, 1870:

From St. Clair	29,408 12
" Port Carbon	6,657 08
" Pottsville	650 02
" Schuylkill Haven	16,121 14
" Auburn	4,512 05
" Port Clinton	11,762 10
" Allentown and Alburtis	243 02
" Harrisburgh and Dauphin	10,117 00
Total paying freight	79,472 13
Coal for Company's use	3,957 03
Total for week	83,429 16
To same time last year	720.3.8 12
Total	803,798 08
To same time last year	775,917 04

Report of coal transported over the Schuylkill Canal for the week ending Thursday, March 24, 1870.

	Tons. Cwt.
From Port Carbon	166 00
" Pottsville	
" Schuylkill Haven	958 06
" Port Clinton	
Total for week	1,124 06
Previously this year	516 05
Total	1,640 11
To same time last year	24,1.4 10

Harrisburgh and Dauphin Coal Trade.

The following is the amount of Bituminous Coal transported via the P. and R. R. for the week ending March 24, 1870:

	Tons.
For week	10,114 06
Previously this year	103,025 14
Total	113.145 14

Delaware and Hudson Canal Company.

Coal mined and forwarded by the Delaware and Hudson Canal Company, for week ending Saturday, March 26, 1870.

	WEEK.	SEASON.
North	50,797 15	490,681 18
South	10,617 10	48,380 01
Total	61,415 05	539,061 19
Corresponding time in 1869.		
North	21,830 15	414,769 19
South	1,570 02	18,666 11
Total	23,400 17	433,436 10
Increase North	28,967 00	Increase 75,911 19
Increase South	9,047 08	Increase 29,713 10
Total Increase	38,014 08	Increase 105,625 09

Penn. and N. Y. Canal and Railroad Co.

REPORT of Coal Transported via the Pennsylvania and New York Canal and Railroad Company, for week ending March 26, 1870:

	WEEK.	PREVIOUSLY.	TOTAL.
Anthracite	6,736 08	56,540 12	63,784 04
Bituminous	4,271 00	48,830 00	41,589 00
Total, Ant. and Bit.	11,007 08	119,420 12	108,313 04

Report of Coal Transported over Lehigh and Susquehanna Railroad.

Week ending March 26, 1870—Compared with same time last year.

WHERE SHIPPED FROM	WEEK, 1870. tons ct	WEEK, 1869. tons ct	YEAR, 1870. tons cwt.	YEAR, 1869. tons cwt.
Wyoming Region	23758 10	12162 19	167481 02	119448 12
Upper Lehigh Region	2877 17	2618 13	10250 13	37059 16
Hazleton Region	300 05	116 13	2943 11	1723 06
Mauch Chunk Region		3158 05	30089 18	49564 19
Totals	26936 12	18056 10	210545 04	207726 13
Increase	8580 02		2818 11	
Decrease				
DISTRIBUTION.				
Forwarded East of Mch Chunk by Rail	21274 04	16993 14	183272 13	188109 07
Delivered at and above Mauch Chunk	61 10	595 14	7327 12	8247 13
Delivered to L. & B. R. R. at Plymouth Bridge	5298 18	467 02	19344 19	6471 12
L. V. R. R. at Sugar N.				4698 01
Totals	26936 12	18056 10	210545 04	207726 13
Of the above there was from Compay's Mines.	1184 11	3158 05	40164 06	49544 19
Increase				
Decrease	1973 14		9380 13	

Report of Coal Transported over Lehigh Valley Railroad

For the week ending March 26, 1870, and previously this season, compared with same time last year:

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	PREVI'S Y. Tons. Cwt.	TOTAL. Tons. Cwt.
Total Wyoming	14,199 14	160,190 17	175,190 11
" Hazleton	39,860 09	382,460 13	422,121 02
" Upper Lehigh	235 00	542 16	777 16
" Beaver Meadow	14,071 01	125,521 16	139,592 17
" Mahanoy	7,208 18	73,120 02	80,329 00
" Mauch Chunk		447 17	447 17
Total Anthracite	75,375 02	750,091 01	829,469 03
Bituminous Coal recv'd from Cata. R. R.			
N. C. R. R.			
E. P. R. R.	982 00	3,310 00	4,292 00
P. & N.Y. C. & R.R. Co			
Fall Creek			
Schroeder			
Towanda			
Total by rail and canal	76,357 02	753,404 01	829,761 03
Same time last year	46,082 08	612,923 15	659,006 03
Increase	30,274 14	140,480 06	170,755 00
Decrease			
Forwarded East from M'h Chunk by rail	66,124 16	663,501 02	729,626 00
Same time last year	44,275 01	579,587 00	623,862 01
Increase	21,749 17	83,914 02	105,663 19
Decrease			

RECAPITULATION.

Forwarded East from M'h Chunk by rail	66,124 16	663,501 02	729,626 00
To N. C. R. R., at Mount Carmel		115 00	115 00
Forwarded North from L. & B. Junction	6,736 08	63,375 19	70,112 07
To L. & S. R. R. at Packerton for rail	402 02	2,194 15	2,596 17
Delivered at M'h Chunk	42 17	375 06	418 03
Delivered on line of road above Mauch Chunk	1,454 08	3,662 19	5,117 07
Delivered above M. Chunk for use of L. V. R. R.	614 09	16,213 11	16,828 00
To L. & S. R. R., at P'n Hav., for railroad			
Do. for canal			
At M. Chunk for canal		655 09	655 09
Total Anthracite	75,375 02	750,091 01	825,469 03
Bituminous Coal	982 00	3,310 00	4,292 00
Total all kinds	76,357 02	753,404 01	829,761 03

Cumberland Coal Trade.

B. & O. RAILROAD

The shipments over the Baltimore & Ohio Railroad for the week ending March 26, 1870, were as follows:

From Georges Creek via Piedmont.	Tons.
Consolidation Co	2,517 08
Borden Co.	2,032 19
Midlothian Co.	227 05
Hamp. & Bait. Co	
From Eckhart R. R.	
C. C. & I. Co.	1,341 14
Total	6,119 06
Previously	53,485 00
Total	59,604 06

Freights.—APRIL, 1870.

TO EASTERN PORTS.	From Philadelphia.	From E. Port and Port Johnston.	From Newburg.	From Rondout.
Amesbury	$3 25	$— —	$	$
Bangor	3 00	— —	2 25	
Bath	2 75	2 00		
Boston	2 75	1 90		
Bridgeport	1 75	1 00	1 20	
Bristol	2 00	1 40	1 45	
Cambridgeport	3 00	2 00		
Derby	2 00	— —		
Dighton	— —	— —	1 50	
East Cambridge	3 00	2 00	2 40	
Fall River	2 00	1 40	1 45	
Hackensack	1 95	1 50		
Hartford	2 75	1 50		
Jersey City	1 75	50		
Middletown	— —	1 25		
Mystic	2 00	1 40	1 35	
New Bedford	2 25	1 50		
Newburyport	3 10	2 00	2 25	
New Haven	1 80	1 00	1 20	
New London	2 00	1 50	1 30	
Newport	2 00	1 40	1 45	
New York	1 25	50	60	
Norwalk	1 75	1 00	1 15	
Norwich	1 90	1 40	1 40	
Pawtucket	2 00	1 50	1 65	
Portland	2 50	1 90		
Portsmouth, N. H.	3 55	2 15	2 20	
Providence	2 10	1 40	1 50	
Rockport	— —	— —		
Saco	3 00	2 25		
Sag Harbor	2 00	1 40	1 35	
Salem	3 00	2 00	2 15	
Stamford	2 00	1 00	1 10	
Stonington	2 00	1 40	1 30	
Taunton	3 10	2 00		
Warren	— —	1 40	1 50	
Washington	1 25			
TO RIVER PORTS.				
Albany		1 00	- 60	
Catskill		— —	- 50	
Cockaackie		— —	- 50	
Coeyman's		— —	- 75	
Cold Spring		— —	- 35	
Fishkill		— —	- 30	
Haverstraw		50	- 60	
Hudson		— —	- 50	
New York		— —	—	
Nyack		50	- 60	
Poughkeepsie		— —	- 35	
Rhinebeck		— —	- 30	
Rondout		— —	—	
Saugerties		— —	- 40	
Sing Sing		— —	- 60	
Stuyvesant		— —	- 55	
Tarrytown		80	- 75	
Troy		1 00	- 75	
West Point		— —	- 35	
Yonkers		40	— —	

Foreign and Provincial Freights.

April, 1870.

Foreign.	
Newcastle and Ports on Tyne, per keel of 21 1-5 tons	£13 10@£14 10
Liverpool	12s.6d@14.ton
TO NEW YORK.	
Provincial	
Sidney	$—
Lingan	—
Cow Bay	—
Port Caledonia	—
Little Glace Bay	—
TO BOSTON.	
Sydney	$—
Lingan	—
Cow Bay	—
Port Caledonia	—
Little Glace Bay	—

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven	$2 00
From Port Carbon, 8 cents per ton more.	
Less drawback of 50 cents on all Coal shipped east of New Brunswick and south of Cape Henry.	
MAUCH CHUNK TO ELIZABETHPORT.	
L. V. Railroad from Mauch Chunk to Easton	$ 81
C. R. R., N. J., Easton to Elizabethport	1 12
Shipping expenses at Elizabethport	25
Warfage	10
Total	$2 28
MAUCH CHUNK TO PORT JOHNSON.	
L. V. R. R., or L. & S. R. R. from M. C. to Easton	$ 81
C. R. R., of N. J., Easton to Pt. Johnson	1 19
Shipping expenses	25
Warfage	10
Total	$2 35
TO HOBOKEN.	
L. V. R. R., Mauch Chunk to Easton	$ 81
Morris & Essex R. R. Easton to Hoboken	1 19
Shipping expenses	25
Warfage	10
Total	$2 35
TO SOUTH AMBOY.	
L. V. R. R.	81
B. & D. R. R. / Cam. & Am. R. R.	1 09
Shipping Expenses	25
Total	$2 15
PENN HAVEN TO ELIZABETHPORT.	
L. V. RR. Penn Haven to Easton	96
C. RR. of N. J. Easton to Elizabethport	1 19
Shipping expenses	25
Wharfage	10
Total	$2 49

BY CANAL.

Via Schuylkill Canal.

TO PHILADELPHIA.	
From Schuylkill Haven	$1 07
" Port Carbon	1 10
" Port Clinton	1 00
TO NEW YORK.	
From Schuylkill Haven	$1 70

Towing Rates.

TO EASTERN PORTS.

	Per Ton.
To New Haven	$ 40
Bridgeport	40
Southport	40
Westport	40
Norwalk	40
Stamford	40
	Per Boat.
Greenwich	$70 00
Port Chester	80 00
Mamaroneck	70 00
Glen Cove	55 00
New Rochelle	55 00
East Chester	60 00
West Chester	30 00
White Stone	30 00
College Point	25 00
West Farms	25 00
Flushing	30 00
Harlem and Mott Haven	20 00
Port Morris	20 00
Ninety-first street and Astoria	16 00

Boats beyond Port Chester, with less than 200 tons, $20 per Boat.

TO RIVER PORTS.

Boats of 150—250 Tons.	Per Ton.
To Manhattanville	9 cents.
Spuyten Duyvil	9 "
Yonkers	10 "
Hastings	12 "
Piermont	15 "
Dobbs' Ferry	15 "
Nyack	16 "
Tarrytown	17 "
Sing Sing	18 "
Croton Landing	19 "
Haverstraw	19 "
Verplanck's	20 "
Peekskill	20 "
West Point	21 "
Cold Spring	21 "
Newburgh	22 "
Poughkeepsie	22 "
Rondout	23 "
Boats of 100 Tons	Per Boat.
To Manhattanville, and Return	$12 00
Spuyten Duyvil	14 00
Yonkers	15 00
Sing Sing	25 00
Peekskill	25 00

Prices of Coal by the Cargo,

[CORRECTED WEEKLY.]

SCHUYLKILL.	AT NEW YORK, April 1. R. A.	W. A.	AT PHILADELPHIA, March 31. R. A.	W. A.
Lump	$— —	$5 00	4 50	4 75
Steamer	— —	5 25	— —	— —
Broken	— —	— —	— —	4 50 to — —
Egg	5 75 to 6 25	5 50	— —	4 50 to — —
Stove	— — to — —	6 00	— —	4 50 to — —
Chestnut	4 50 to 5 40	5 00	—	4 00 to —
Pea	— —	— —	— —	— —
LEHIGH.				
Lump	6 00	— —	— —	— —
Broken	5 75	— —	— —	— —
Egg	5 75	— —	— —	— —
Stove	6 00	— —	— —	— —
Chestnut	5 25	— —	— —	— —
Pea	— —	— —	— —	— —
SPECIAL COALS.*				
Diamond Vein	R. A.	— —	— —	— —
New England	"	— —	— —	— —
Locust Dale	W. A.	— —	— —	— —
Honey Brook, Le'h	W. A.	4 75 to 5 50	— —	— —
Spring Mountain	" "	4 75 to 5 50	— —	— —
Sugar Creek	" "	4 75 to 5 50	— —	— —
Sugar Loaf	" "	4 75 to 5 50	— —	— —
Old Comp'y's.	" "	4 75 to 5 50	— —	— —
Cross Creek	" "	4 75 to 5 50	— —	— —
Enterprise	" "	— —	— —	— —
Girardville	" "	— —	— —	— —
McMichael	" "	— —	— —	— —
Shamokin	" "	5 50	4 50	— —
Lykens Valley	" "	— —	— —	— —
Broad Top	" "	— —	4 00	— —
Hill & Harris	" "	— —	4 50	— —
Henry Clay	" "	— —	4 50	— —
Powelton	" "	— —	4 50	— —

Prices for Coal at Mauch Chunk.

	F.L.	Bro.	Gra.	Eg.	Sto.	Cat.
Lehigh	$3 00	$3 25	$3 25	$3 25	$3 75	$3 00
Wilkesbarre	3 00	3 25	3 25	3 25	3 75	3 00

For freight to Elizabethport and to New York see "Freights."

BITUMINOUS COALS.

Kittaning Coal Co.'s Phœnix Vein..f.o.b. at Phila.	$5 25
" Lemon " "	5 00
Cumberland Vein Coal	5 00
Cumberland C. & I. Co.'s on board	N. Y. 7 00
Maryland Coal Co. "	" 7 00
Consolidated Coal Co.'s "	" 7 00

(*Dealers in these coals may be found in our advertising columns.)

Company Coals.

	L.	Str.	Gra.	Eg.	Sto.	Ches.
Scranton at E. Port	— —	— —	— —	— —	— —	— —
Pittston at N. Y.	4 50	4 50	4 55	4 60	5 25	4 40
Lackawana at Weh'kn.	— —	— —	— —	— —	— —	— —
Wilk'b're at Hoboken.	4 75	4 75	4 85	5 25	5 75	4 75
Old Co. Lehigh at Pt. Johnston	— —	— —	— —	— —	— —	— —
Lehigh at E. Port	5 50	5 25	5 25	5 25	5 50	4 75

For freights to different points, see "Freights."

Prices of Foreign Coals.

April, 1870.

Duty $1 25 per ton.

Corrected weekly by PARMELE BROS., No 32 Pine street, New York.

Liverpool Gas Caking	$ 8 00@— —
" " Cannel	10 00@12 00
" House "	13 50@15 50
" " Orrel	12 00@14 00

Per ton 2,240 lbs., ex-ship.

PRICES FROM YARD.

Liverpool House Orrel, screened	$16 00@17 50
" " Cannel "	18 00@20 00

Per ton 2,000 lbs., delivered.

Prices of Gas Coals.

April, 1870.

PROVINCIAL.

Corrected weekly by Louis J. Belloni, Jr., 43 Pine st., N. Y.

Duty, $1 25.	Coarse. Gold.	Slack. Gold.
Block House	$1 75 @- 75	
Gowrie	1 75 @- 75	
Lingan	2 13¾@- 71½	
Sydney	2 13¾@1 81¾	
Pictou	1 50 @1 00	
Little Glace Bay	1 50 @- 75	
Caledonia		

AMERICAN.

	Coarse.	Slack. Currency.
Westmoreland Co	— —	@— —
Despard Coal Co	$7 50	@— —
Penn	— —	@— —
Newburg Orrel Gas	— —	@— —
West Fairmount Gas Coal	— —	@8 00

AT PHILADELPHIA.

Powelton $7 80

Prices at Baltimore—April, 1870.

Wholesale Prices to Trade.

Wilkesbarre, by cargo or car load	$6 60@6 75
Pittston and Plymouth	6 00@6 50
Shamokin Red or White Ash	6 00@6 25
Lykens Valley Red Ash	— —@6 50
Zerba Valley	6 00@6 25
Trevorton, Red Ash	6 00@6 50
By retail, all kinds per ton of 2240 lbs.	7 25@8 50
Georges Creek & Cumberland f. o. b. at Locust Point for shipping	— —@5 00
West Fairmount Gas f. o. b.	6 00@6 50

Prices at Georget'n, D.C., & Alexandria, Va.

April, 1870.

George's Creek and Cumberland f. o. b. for shipping . . $4 75

Prices at Havre de Grace, Md.

Wilkesbarre and other White Ash for cargoes	$— —@— —
Lykens Valley	— —@— —
Shamokin Red or White Ash	— —@— —
Trevorton and Zerba Valley	— —@— —

METALS.

NEW YORK, March 30, 1870.

IRON.—Duty: Bars, 1 to 1¼ cents ℔ lb; Railroad, 70 cents ℔ 100 lbs.; Boiler and Plate, 1½ cents ℔ lb; Sheet, Band, Hoop, and Scroll, 1¼ to 1¾ cents ℔ lb; Pig, 9 ℔ ton; Polished Sheet, 3 cents ℔ lb.

Pig, Scotch No. 1, ℔ ton	33 00@37 00
Pig, American, No. 1	33 00@34 —
Pig, American, No. 2	31 —@32 —
Pig, American, Forge	30 —@31 —
Bar, Refined, English and American	— —@75 00
Bar, Swedes, assorted sizes (gold)	85 00@97 50
	Store Prices.
Bar, Swedes, ord'y sizes, less 5 ℔ ct.	115 —@125 —
Bar, Refined " "	77 50@— —
Bar, Common " "	72 50@— —
Scroll " "	87 50@115 —
Ovals and half-round " "	95 —@110 —
Band " "	95 —@— —
Horse Shoe " "	95 —@— —
Rods, ⅜ to 3-16 inch " "	85 —@120 —
Hoop " "	105 —@145 —
Nail rod, less 5 ℔ ct.	— 7 @—7¼
Sheet, Russia, as to Nos. (gold)	— 11—@—12—
Sheet, Single, D, and T. Common	4¼—@— 6½
Sheet, Galvanized	List 25@30 ℔ cent. discount.
Rails, English (gold), ℔ ton	58 00 @58 50
Rails, American, at Works in Pa	76 00 @77 00

STEEL.—Duty: Bars and ingots, valued at 7 cents ℔ lb or under, 2½ cents; over 7 cents and not above 11, 3 cents ℔ lb; over 11 cents, 2½ cents ℔ lb, and 10 ℔ cent ad val. (Store prices.)

English Cast (2d and 1st quality) ℔ lb	— 16 @— 20
English Spring (2d and 1st quality)	— 7 @— 10
English Blister (2d and 1st quality)	— 11 @— 18
English Machinery	— 11½@— 14
English German (2d and 1st quality)	— 13 @— 15
American Blister "Black Diamond"	— — @— 12
American, Cast, Tool do.	— — @— 18
American, Spring, do.	— 9 @— 12
American Machinery, do.	— @— 12
American German, do.	— 10 @— 12

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper 20 cents ℔ lb; Manufactured, 45 per cent. ad val.

	All Cash.
Copper, New Sheathing, ℔ lb	— @— 31
Copper Bolts	— @— 31
Copper Braziers, 16oz. and over	— @— 31
Copper Nails	38 @— —
Copper, Old Sheathing, &c., clean	17 @— 18
Copper, Chili Pig	— @— —
Copper, American Ingot	19½@— 19¾
Yellow Metal, New Sheating	24 @— —
Yellow Metal Bolts	24 @— —
Yellow Metal Nails	— @— 24

LEAD.—Duty: Pig, $2 ℔ 100 lbs.; old Lead, 1½ cents ℔ lb; Pipe and Sheet, 2¼ cents ℔ lb.

Galena, ℔ 100 lbs	$— — @— —
Spanish (gold)	6 15 @6 20
German, do.	6 15 @6 37½
English, do.	6 20 @6 62½
Bar (net)	— — @ 7 75
Pipe and Sheet (net)	— — @ 7 75

TIN.—Duty: Pig, Bars, and Blocks, 15 ℔ cent. ad val.; Plate and Sheets and Terne Plates, 25 ℔ cent. ad val.

	Gold ℔ lb.
Banca	33¾@34
Straits	32¼@32½
English	30 @31½

PLATES.

Fair to Good Brands.	*Gold.*	*Currency.*
I. C. Charcoal, ℔ box	$8 25 @8 50	$9 75 @10 00
I. C. Coke	7 00 @7 50	8 25 @ 9 00
Coke Terne	5 75 @6 00	6 75 @ 7 —
Charcoal Terne	7 37½@8 00	8 75 @ 9 50

SPELTER.—Duty: In Pigs, Bars, and Plates, $1 50 ℔ 100 lb.

	Gold.
Plates, Foreign ℔ 100 lbs.	$6 00 @6 12½
Plates, Domestic ℔ lb.	10 @— 11¼

REMARKS.

IRON.—Scotch Pig continues in moderate request, but prices are unchanged; the stock at dock is very light, and dealers are compelled to purchase in small lots from yard as their wants compel; 100 tons Eglinton sold on private terms. We quote Gartsherrie from yard $35, and Glengarnock $34@35. There has been only a moderate inquiry for American since the large sale noted in our last, the trade being well supplied by the liberal purchases then made; prices remain about as previously noted. We notice sales of 1,500 tons No. 1 Thomas, at $33, and 500 do. No. 2, $31. Wrought Scrap is in active demand at steady prices, and sales have been made of 650 tons No. 1 on private terms. Rails continue in active request, and as the supply is light, prices are firm at the advance previously noted; $38 gold has been refused for old Double-head, to arrive; the sales are 3,500 tons New English, part at $59 gold; 2,500 do. American, on private terms; 500 do. old T, $43 50; and 300 do. same, to arrive, on private terms. Bar from store is without further change, though there is more tone to the market.

LEAD.—Pig remains very dull and we have only to notice the sale of 50 tons Spanish, to arrive, at a private price. Bar, Pipe and Sheet, are still quoted at 7¾c. net cash.

COPPER.—The manufactures of Copper and Yellow Metal are steady at our quotations. Ingot, though quiet, is held with firmness, and prices are again a little higher; the transactions embrace 75,000 lbs. Lake Superior. at 19½c.; and 25,000 lbs. do. 19¾c. cash.

TIN.—Pig has moved more freely, there having been considerable business at about the rates previously ruling; the transactions embrace several hundred slabs Billiton, in Boston, at 32 cents, and 100 do. here, 32½c., both 30 days; 10 tons English, 31c., all gold; and 5 tons do. and 800 slabs Straits on private terms. Plates are dull, and we have only to notice the sale of 1,000 bxs. Assorted Charcoal Tin on terms not made public.

SPELTER.—Foreign is entirely neglected, and prices are altogether nominal.

ZINC.—American Ox. Zinc, 6½ @ 7c.; French do., 10 @ 10½c.; Sheet Zinc, 9½ @ 10½c.

MANGANESE—Ox. Manganese, 4½ @ 5c. per lb.

Mining Stocks.

NEW YORK, March 31, 1870.

The prices in the Mining share market have not materially altered since our last. Black Hawk sold this A. M. at 80 cents, and Quartz Hill at 48 cents, which are the most noteworthy changes. Reference to our list of quotations elsewhere will give the condition of the market to date.

Petroleum stocks are firmer. Central is quoted at 55 to 60 cents; Home, $3. The following is the latest report of the Stock Board:

	Bid.	*Asked.*
Bennehoff	30	35
Bergen Coal and Oil	50	—
Bliven Oil	30	1 00
Brevoort	—	1 00
Buchanan Farm	38	45
Central	55	60
Home Petroleum	3 00	—
National	—	—
N. Y. and Alleghany	1 50	—
Northern Light	75	1 00
Pithole Creek	1 25	—
Rathbone	25	—
Rynd Farm	33	35
Second National	—	—
Tarr Farm	—	—
United Petroleum Farms	25	—
United States	72	77

San Francisco Stock Market.

Nothing new in reference to Nevada and California Mining stocks since our last. Reports are so conflicting that we prefer to omit them until we can obtain something reliable.

Big Horn Mountains and Black Hills Exploring Expedition.

THE following is copied from a neat little pamphlet circulated in the interest of the abovenamed Association:

"The object of this Association is the exploration of the country to the north of the Union Pacific Railroad, in Wyoming Territory, from the base of the Black Hills to the Big Horn Mountains. Evidences, the accumulation of years, and especially the observations of many persons who have been enabled to temporarily visit that portion of this Territory, have induced the fitting out of this expedition in search of extensive deposits of gold which are believed to exist in as rich profusion as was found in Idaho and Montana. The climate of the Big Horn country is known to be mild and salubrious. The natural vegetation of the country, its variety of timber, profuse growth of grasses, etc., prove that the value of the country for agricultural purposes is undoubtedly superior to that of most parts of the Western States or Territories. Game of all kinds is abundant, and being its natural home, must prove an excellent pastoral region for domestic animals as well. It is confidently believed that the government will this spring re-occupy Forts Reno, Phil. Kearney, and C. F. Smith; but in any event, the force of this expedition will be strong enough to sustain itself. The indications are that the number who will join the explorers will reach several thousand, a force large enough at least to successfully oppose any force of Indians which may be found in hostility to them. By careful calculations, it is thought that for about $75 a man can be furnished with four months' provisions and ammunition, and transportation for three hundred pounds, estimated weight of the same, and which would allow of some tools and clothing to be carried free. Numbers of parties will accompany the expedition with stores, so that extras can be had on the journey as well as at the point of destination. Arrangements have been made for cheap transportation over the various railways to Cheyenne. Parties for the expedition, in squads of twenty-five men, will be carried from Chicago to Cheyenne for $37, or from Omaha to Cheyenne for $25 for each person, and two hundred pounds of freight free. A good wagon road runs from this point almost the entire distance, through a fine grazing country. This road was used for years by the government in supplying the forts before named. The military control of the expedition is only to the extent of protection on the route and at other times of danger. Upon arriving at such point as the expedition may agree to explore, every man will be at liberty to prospect for himself, or with such associates as he may select, and all will enjoy the fruits of their own labor. Parties desirous of participating in the advantages of this expedition, may do so by furnishing a substitute upon such terms as may be agreed upon between themselves, and on complying with the terms of the constitution of the association.

A Correction.

MARCH 25th, 1870.

TO THE EDITOR: Please correct a typographical error in my article on "Bitumen and Coal in Texas"—page 185, in your last issue, March 22d, 1870. The extent of the area occupied by the coal measures is 6,000 square miles, instead "600."

A. R. ROESSLER.

MINING COMPANIES AND STOCK QUOTATIONS.

GOLD AND SILVER COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
Alameda Silver		A. Queran, 108 Wall st	$2,000,000	$10 00		
Ada Elmore	South Boise, Idaho					
American Flag	Nevada District, Col	P. P. Fullerton, 71 B'way	600,000	10 00		
Atlantic and Pacific	Humboldt Co., Nevada.					
Bates and Baxter	Colorado			50 00		
Benton	Colorado	W. F. Drake, 15 Broad	500,000	5 00		
Briggs	Colorado	J. P. Davies, 19 Cliff	1,000,000	100 00		
Black Hawk	Colorado	C.T.Whittington, 48 Broad	2,500,000	100 00	60	100
Bobtail	Colorado	J. Stanton, Jr., 25 Nassau	1,000,000			
Bullion Consolid'ed Gold	Colorado					
Burroughs Gold	Colorado					
Central Gold					22	25
Consolidated Gregory	Colorado				2 00	2 05
Combination Silver	Nevada			100 00		1 50
Columbia Silver	Austin, Nevada	J. M. Brown, 155 B'way	5,000,000			
Commercial Silver		J. E. Smith, 26 Pine	3,000,000			
Corydon	Gilpin Co., Colorado	J. Samuels, 40 B'way	500,000			
Downieville	Colorado		2,500,000	25 00		
Eagle Gold	Gold Dirt Dist., Col	J. P. Davies, 19 Cliff	300,000	1 00		
Empire Gold and Silver	BodieBluff,MonoCo.Cal	H. K. Gates, 70 B'way	1,000,000			
Edgehill		A. Fullerton, 71 B'way	10,000,000			
Esperanza Silver		Ezra Clark, Jr., 13 William	400,000			
Fisk Gold		H. Johnson, 195 Fulton	500,000			
Forest Queen		E. B. Beet, 62 B'way	1,000,000			
Golconda Gold	Sherbrooke, C. E	H. Adams, 71 Broadway	2,000,000			
Gunnell Gold	Colorado	J. H. Rolston, 80 B'way	1,000,000	50 00		
Gunnell Central	Colorado	C. B. Bostwick, 16 B'way	3,000,000	10 00		
Gold Rock		R. M. Lockwood, 93 Wall	400,000			
Grass Valley					24	
International Silver		J. W. Brazier, 26 Pine	600,000			
Hope Gold	Colorado		5,000,000			
Holman			2,000,000	25 00		
Kipp & Buell	Colorado		300,000			
Knickerbocker Gold		J. H. Rolston, 80 B'way	200,000	100 00		
La Crosse Gold	Nevada Dist., Col	P. P. Fullerton, 71 B'way	1,000,000		10	12
Lander Hill T. & S	Nevada	M.L.Catherwood,74 B'way	1,000,000			
Lewis Gold	Georgia		1,000,000			
Liberty Gold					1	3
Manhattan Silver	Nevada	M. L. Ogden	400,000			
Maraposa common	California	Jas. H. Ferdon, 34 Wall	12,000,000			9½
Mariposa preferred	California	do. do.			18	18¾
Montana Gold		G. De Cordova	400,000		3	
Montana M. L. & M. Co.	Montana	A. M. Hoyt, 22 William	250,000			
Montrose	Clear Creek Co., Col	W. W. Perkins, 71 B'way	1,000,000			
New York Silver	Nevada	Thos. Sproull, 78 B'way	1,500,000			
New York and Austin	Nevada	E. R. Siccomb, 70 Wall	500,000			
New York and Owyhee	Owyhee Co., Idaho		1,000,000			
New York and Eldorado		G. H. Munroe, 10 Wall	2,000,000		10	
N. Y. & Montana M. & D.	Montana	F. A. Chapman, 20 Nassau	1,250,000			
N. Y. & Silver Peach	Nevada	R. C. Root, 74 B'way	2,000,000			
N. Y. & Utah P. & M		W. H. Mailler, 108 Wall				
Nye						
Ophir Gold	Comstock Lode, Nev	L. C. Warner, 70 B'way	625,000			
Owyhee Gold		W. H. Smith, 43 Ex. Place	1,700,000			
Pahranagat Central	Nevada	J. E. Smith, 25 Pine	6,000,000			
Quartz Hill Gold		F. Bernard	2,500,000		50	
Reese River Consol'd	Nevada	W. B. Ogden	6,000,000			
Rocky Mountain	Colorado	S. M. Pond, 70 B'way	500,000	10 00	4	7
Rollins Gold		Thos. Bond, 132 B'way	600,000			
Sensenderfer	Colorado	H. A. Shewill, 19 Broad	1,000,000		1 00	
Silver Bend		F. W. Macy, 20 Nassau	1,500,000			
Silver Mt. Silver		H. A. Moen, 71 B'way	1,000,000			
Silver Peak & R. M.	Nevada	W. B. Ogden, 52 Wall	5,000,000			
Smith & Parmelee	Colorado	W. H. Hollister, 6 Broad	2,500,000	20 00	1 55	1 65
Social & Steptoe Con		T. H. O'Connor, 24 Nassau	450,000			
Standard Gold		C. B. Bostwick, 169 B'way	500,000			
Symonds Forks					35	
Twin River Silver	Nevada	J. F. R. Hadden, 20 Nassau	800,000	100 00		
Texas Gold	Colorado		500,000	10 00		
Union Gold	Colorado	F. A. Potts, 110 B'way	1,200,000			
Wash. Mill & Silver	Nevada	W. W. Perkins, 71 B'way	300,000			
Wauba Yuma	Arizona	J. W. Silsby, 36 Pine	6,000,000			

COAL AND IRON COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED
American Coal Co		M. A. Myers, 119 B'way	$1,500,000	$25 00		
Ashburton Coal Co		J. T. Rollins, 41 Pine	2,500,000			
Block House Coal		D. B. Keeler, Jr., 43 Pine	1,000,000			
Brewster Iron		H. Robison, 165 B'way	150,000			
Broad Top Coal & Iron Co	Pennsylvania	B. Love	2,000,000			
Cameron Coal Co		J. A. Simpson, 40 B'way	2,500,000			
Carbon Hill Coal Co		J. Silsby, 36 Pine	1,000,000			
Central Coal		F. P. White, 111 B'way	2,000,000	100 00		
Clifton Iron Co		P. H. Riordan, 34 Pine	1,250,000			
Columbia Iron		F. D. Webb, 77 Cedar	1,000,000			
Consolidation Coal	Maryland	J. S. Mackie, 71 B'way	5,000,000			
Crawford Coal		E. Clapp, Prest, 137 B'way	1,000,000			
Cumberland C. & I. Co		E. Kisean, 90 B'way	5,000,000		27 75	32 00
Derby Coal Co		W. S. Davison, 11 Broad				
Dover Coal and Iron Co		L. Chase, 88 Wall				
Del. & Hudson Canal Co		R. H. Nerderpol, 7 Nassau	15,000,000	100 00	100	
Ebervale Coal		G.L.Stout, Treas.,111 Br'y	500,000			
Fall River Bituminous		D. T. Blauvelt, 43 Pine	1,000,000			
Farrar Coal		C. H. Jones, 43 Pine	250,000			
Fisher Iron Co		M. Ellis, 19 William	100,000			
Hamp're & Balt. Coal		S. M. Pond, 70 B'way	500,000			
Iron Cliffs Co		C. J. Canda, 52 Wall	1,000,000			
Jackson Iron		G. P. Loyd, 119 B'way	300,000			
Kemble Coal & I. Co		R. A. Wight, 26 Ex. Place	300,000			
Keokuk Coal		J. F. Franklin, 112 B'way	100,000			
Lackawanna I. & C	Pennsylvania	E. C. Lynde, 52 Wall	1,200,000			
Lewis Run C. & I. Co		C. A. Sanborn, 80 B'way	750,000			
Lykens Val. Coal Co		F. A. Platt, 13 William	800,000			
McKean Co. Bit. Coal Co		J. H. Rolston, 80 B'way	1,500,000			
Lehigh & Susquehanna		E. W. Cark, Philadelphia, Pa.				
Mahanoy			400,000	100 00		
McNeal C. & I. Co		C. C. Godwin, 71 B'way	500,000			
Mount Riga Iron		G. M. Newton, 42 Cedar	300,000			
New Boston Coal		C. H. Ogden, 55 B'way	2,000,000			
N. Y. Con. C. & I. Co		A. T. Levine, 16 Wall				
N. Y. & Lehigh Coal		T. Simpson, 111 B'way	150,000			
Pacific Coal Co		G. Wrighton, 34 Wall				
Peekskill Iron Co		W. Murdock, 7 Nassau				
Pennsylvania Coal Co		E. H. Mead, 111 B'way	3,200,000	50 00		
Richmond Iron Co		C. H. Smith, 165 B'way	1,000,000			
Scotia Coal Co		I. N. Soper, 42 B'way	2,500,000			
Spring Mt. Coal		C. Runyon, 111 B'way	1,250,000			
Springfield & D'p Run C.		E. D. Webb, 77 Cedar	600,000			
Stout Coal Co		O. S. Comstock, 111 B'way	500,000			
Susquehanna & Wyoming		E. Potter, 40 B'way	1,000,000			
Tannerdale Coal		I. T. Ludlaw, 71 B'way	250,000			
Wash. Mutual Coal		M. C. Baker, 117 B'way	420,000			
West Point Iron Co		R. C. Brock, 110 B'way	500,000			
Wilkesbarre C. & I. Co		W. H. Tillinghast, 80 Br'y	3,400,000			
Wyoming Val. Coal Co		E. Potter, 40 B'way	1,000,000			

COPPER AND LEAD COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED
Anita Copper	California	J. A. Ferguson, 8 Wall				
Corinth Copper	Corinth, Vermont	S. H. Howard, 191 B'way	$500,000	25 00		
Davidson Copper						
Eagle Harbor Copper	Michigan	W. H. Smith, 43 Ex. Place	500,000	25 00		
Evergreen Bluff Copoer	Michigan	F. W. Caper, 44 Ex. Place	500,000	25 00		
Globe Copper		R. K. Rickard, 19 Nassau	200,000			
Grand Portage Copper Co		A. S. Kellogg, 22 Pine	500,000			
Guymard Lead		Samuel Vernor, 38 Pine				
Hilton Copper		W. H. Smith, 43 Ex. Place	500,000			
Hope Copper		J. W. Davis, 19 Nassau	500,000			
Hudson River Copper	New York	T. Clarkson, 22 William	1,500,000			
Indiana Copper Co		J. M. Mills, 25 Nassau	500,000			
Isle Royale Copper	Michigan	F. W. Caper, 44 Ex. Place	1,000,000			
Keweenaw Copper	Michigan	F. W. Caper, 44 Ex. Place	500,000			
Lake Superi'r Silver Lead	Michigan	A. S. Kellogg, 22 Pine	1,000,000			
Omiga Copper	Michigan	S. Cooper, 7 Pine	500,000			
Ridge Copper	Michigan	J. L. Gardiner, Jr., 43 Ex. P	500,000			
Rockland Copper	Michigan	A. Fullerton, 71 B'way	500,000			
St. Joseph Lead	Michigan	J. W. Jones, 6 Broad st	1,000,000			
St. Marguret Copper		E. P. Sutton, 43 Pine	250,000			
Schoolcraft Copper		R. Walsh, 22 William	500,000			
Superior Copper	Michigan	A. Fullerton, 71 B'way	500,000			
Union Copper		A. S. Kellogg, 22 Pine	500,000			
Vermont Copper	Vermont	J. C. Fly, 191 B'way	500,000			
Wallkill Lead, asst		S. M. Pond, 70 B'way				

MISCELLANEOUS.	SITUATION MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED
American Zinc Co		W. E. Lawton, 19 Cliff	$1,000,000			
Bigelow Blue Stone Co		H. Bogardus, 14 Pine				
Quicksilver					9¾	10
Covill B. L. M. & M'f. Co		C. R. Bostwick, 302 Pearl	250,000			
Manhattan Marble		H. K. Gates, 70 B'way	300,000			
N. Jersey Zinc Co	New Jersey	A. H. Farlin, 61 Maiden L'e	1,500,000			

Electrical Process for Winning Gold and Silver from their Ores.

The possible in science is always measured from the standpoint of present attainment. That announcement, therefore, which proposes the accomplishment of an issue not yet brought within the range of acknowledged principles, or recognized as a legitimate and near result of well ascertained powers, is generally assailed with doubt, and entertained only with credulity. No great step beyond the verge of accepted actualities has yet been made in any department of science or discovery, in any age, or among any of those who by profession claim super-eminence in specialties, without having excited opposition, not always confined to argument or logical demonstration. It has been eminently so with regard to the practical application of electrical agency for the separation of gold and silver from their ores.

Many years since the very eminent electrician and physicist, MONS. BECQUEREL, of Paris, made the announcement of a practical success of its application. The scientific world listened because of their respect for this man of science. Neither the popular mind, nor those devoted to scientific research, however, were prepared to accept the declaration as evidence of a tangible fact, or that it was capable of practical realization. The almost recent shock experienced in scientific circles, when the wonderful and miraculous agencies developed by the voltaic pile, were made public, served to repress dissentient outbursts of either ridicule or denunciation; but no outgrowth of admitted possibility was shown by experimental attempts to demonstrate its falsity or truth. Yet at this very time, electrical knowledge had made such prodigious advances, that to no force in nature was science more eager to attribute such illimitable destructive, or creative powers. Chemical agencies were acknowledged to be universal, and the most eminent philosophers were even then prepared to grant almost co-ordinate powers to those termed electrical. Indeed, as strange as it may appear, the scientific were at this time disposed to demonstrate the existence of identical relation between the force by which the elements of bodies are bound together in chemical combination and that force or agent developed by the galvanic or voltaic battery. Yet, although treading thus on the confines of that domain into which BECQUEREL had dared to venture, not one was there, among them all, who would venture to adopt or endorse his theory. Either fear, sensitiveness, or pre-occupation debarred the former from eliminating from mere theory or wayside experiment, a practical development of the principles upon which his declaration of results was predicated. Certainly the practical world has not yet been benefited by this introspective declaration, and the industrial arts have as yet remained unaided by the practical adaptation of powers deemed second only to those which commanded the existence of matter.

Whether this is so to remain for an indefinite period, depends upon the results of experimental trials now being made here, and most probably elsewhere, but more especially in Colorado. Those engaged here have attracted about as much attention as new explorers in the illimitable domain of processes usually do, certainly as much as those who, in recent years, have prospected in the same direction. Severely have they been let alone to work out their own salvation, or turn their attention to less seductive fields of speculation. These gentlemen having quietly pursued the fugacious phantom of success undisturbed, it is now due to them, and will be of interest to an expectant public, to state who they are, as well as what they have accomplished. The Hon. T. T. DAVIS, the senior of the two, has occupied distinguished political positions, is a gentleman of ample private fortune, acquired in active business. Becoming convinced of the subtle powers of electricity, used for therapeutical purposes, he readily becomes a willing contributor of means to develop its powers when applied to inorganic matters. Dr. RAE, under whose skilful manipulations this agent had accomplished a cure otherwise impossible, having been engaged in experiments for several years, aiming to separate the precious metals from their ores by the application of electricity, presented results which indicated a final success sufficiently satisfactory to warrant the expenditure of both time and means. For the purpose of engaging in a practical demonstration of the principles which, in a small way, had thus produced promising results, these gentlemen came to Colorado some months since, and took up their residence at Empire.

Dr. J. H. RAE, educated as a physician of the old school, early in his professional career, adopted electricity as a therapeutical agent. A twenty years' devotion to the study of its application and its powers, fitted him especially to undertake experiments with these powers upon inorganic substances, such as the ores of the precious metals. These experiments gave sufficiently promising results to warrant the filing of a caveat in August, 1866. On February 5th, 1867, a patent was issued, being the first granted covering the application of electricity for the separation of the precious metals from their ores. Another patent followed March 12, 1867, and finally a third, October 13, 1868, covering the use of electricity in amalgamating, under the action of an independent current of electricity. Under this last form of application, the experiments were and are being conducted at Empire. The apparatus employed is described as quite simple in construction, consisting of a long cylinder, capable of holding say one hundred pounds of pulverized ore. This is lined within with copper, a shaft, acting as an axle, traverses the cylinder from end to end. This shaft is covered with zinc, so arranged as to present radial points, reaching to the internal periphery of the cylinder. Both the copper lining and the zinc armatures of the shaft are entirely insulated. Into this cylinder is placed the amount of ore designed, sufficiently wetted to move liquidly. A charge of ten pounds of mercury, and a small proportion of chemicals, are then added. This arrangement excites electrical action when revolved, and in the space of four hours, ordinarily, the charge is run into settling or washing vats. The method, so far, is simple, rapid, and economical, and claimed to be efficient and successful. It is said that about one hundred and fifty tons of tailings, and lots of ore, have been operated upon with results highly gratifying to the operators. At present, it is not proposed to make a public statement of the results in figures. These are the first experiments made on a practical scale, by operators wholly unacquainted with the practical detail required in the manipulation of ores, and in consequence there has not been observed that close system of record so essential to convince men experienced in such investigations. Suffice it for the present to say, that practical results have been reached through the medium of a new principle in metallurgical manipulation—that such results have been obtained in a *bona fide* manner, at the expense of the operators—that the mining public has not been solicited to contribute anything in that behalf—that those results reached the actual shipment of bullion, and were deemed most satisfactory to the experimentalists, while carrying with them a well sustained conviction that the principle was capable of further development, promising results of the most satisfactory character. Free ores were found to operate without obstruction; exposed tailings gave up a largely increased value over the product of stamp reduction. Desulphurized ore exhibited a perfectly tractable disposition to the activity of the principle. It mattered not by what method said desulphurization had been accomplished. These facts are given to the public without reserve; not for the purpose of commending to its confidence a new process, but exclusively as a matter of absorbing interest. We are not prepared to endorse the method, either as practical, or efficacious in results. Personally, we have neither had opportunity to observe the one nor test the other. But we have no hesitation in observing in this public manner, that the experimentors and experiments are entitled to the confidence of the community, whilst the results give the highest promise of a successful application, of a cheap and constantly acting agent in the economical reduction of all classes of Colorado ores, containing the precious metals. When more complete demonstrations are concluded, the public will be informed of the results obtained.—*Daily Colorado Herald.*

[The subject of extracting gold and silver from their ores by means of electricity, has received considerable attention of late on the Pacific coast, especially at San Francisco, where several parties have been experimenting during the last year. Some of these claim an entire success, but none of the processes have, so far, been made public, or executed on a working scale. We await with interest further developments.]

New Plan of City Travel—The Girdle Railway.

THE following plan for the construction of a system of city passenger railway for the relief of the metropolis, is both novel and interesting, and while this as yet open question remains still unsolved, will doubtless command public interest. Its author is General EGBERT L. VIELE:—

The question of rapid transit through the city has been so thoroughly discussed, so many plans have been presented, all possessing merit—some of them peculiarly fertile in engineering expedients—that it has finally been reduced to one point—viz., that of "least injury to property." The peculiarly insulated position of the city clearly limits its possible extension in every direction excepting to the north, and its topography defines positively all its lines of communication, while its geological formation almost precludes the adaptation of any plan of speedy locomotion, however successful, which may have been executed in any of the other large capitals of the world, In the city of London, for instance, there are ten main lines of railway converging towards the centre of the metropolis, one passing directly through it. Some of them are elevated, and one is underground, but London lies in a basin, and its geological formation is a vast clay deposit, while New York lies on a ridge of upturned primitive rock. London diverges from a centre, while New York extends in a lateral direction. Hence the great difficulty in carrying out in New York a system of communication adapted to London. The same comparison will apply to Paris. Any line of communication selected through New York, whether underground, elevated, or on the surface, must interfere in some way with the property or with the streets, already too limited in their capacity for the purposes of trade.

Surface Roads and their Drawbacks.—In fact, surface roads have already multiplied to an almost fatal extent, so far as business is concerned, and yet with the vast network of rails which gridiron the city, the means of transit are still limited, uncomfortable, and disgusting to every sense. No words can describe the present condition of surface railways more graphically than the report of an eye-witness, as published in the *Herald*, March 13, 1870, and in which the following table was given, showing the number of passengers carried one evening in certain cars:

No.	*Line.*	*No. of Passengers.*
44	Fourth avenue	52
45	Thirty-fourth street ferry	61
58	Third avenue	42
1	Fourth avenue	48
112	Third avenue	69
13	Bleecker street	84
50	Fourth avenue	60
37	Thirty-fourth street ferry	69
59	Eighth avenue	58
30	Eighth avenue	64
56	Sixth avenue	91
31	Eighth avenue	52
9	Fourth avenue	61
12	Bleecker street	79
46	Third avenue	49
194	Third avenue	58
55	Fourth avenue	32
91	Bleecker street	82
111	Third avenue	61
82	Thirty-fourth street ferry	32
81	Avenue B	62
15	Bleecker street	54
15	Third avenue	42
84	Fourth avenue	38
20	Sixth avenue	86
4	Sixth avenue	74
39	University place	35
32	University place	42
11	University place	29
107	Seventh avenue	46

It will thus be seen that thirty cars, whose proper complement of passengers would be 660, actually carried a total of 1,712. Nothing need be added to prove the inadequacy of this means of locomotion. To increase the number of cars would materially impede commercial facilities still more. These facts, so constantly present before the citizens of New York, have stimulated the numerous conceptions which have been presented to the public for remedying the evils arising from the want of proper means of transit, and, while capital and enterprise stand ready to promote any practical plan which will fulfil the requisite conditions, the very magnitude of the subject requires that any plan which meets with approval must be based upon a clear, full and positive demonstration of its entire feasibility. If a line of communication were found along which a rapid transit could be established which would not take away or destroy any available property; which would not interfere with other means of locomotion, or with any commercial facilities, and which could be operated with an ever reliable and positive power, capable of moving an unlimited number of passengers at any moment and at all hours, while offering no engineering obstacle to its construction, it cannot be doubted for an instant that this would be an absolute solution of the long-vexed problem. It is confidently believed that the plan of "The Girdle Railway" now submitted, fulfils all of the above conditions in every particular; that in addition to this, the two leading questions in engineering, namely, that of grade and of motive power, being clearly answered, there remains only the simple determination of the requisite strength of the materials to be used.

The Route.—The route selected is the line defined and determined by act of the Legislature, passed April 17, 1857, entitled "An act to establish bulkhead and pier lines for the port of New York." By said act the bulkhead line is permanently fixed, beyond which it is unlawful to fill in with earth, stone or other solid filling, and unlawful to erect any structure exterior to it. As the direction of this line was laid down by a scientific commission, in harmony with the currents of the river, it is generally continuous, with regular and easy curves, with two or three unimportant exceptions, and in that particular is suitable for a line of railway. It is, moreover, the only route where the use of steam as a motive power would not be objectionable, and where no established interest could be possibly interfered with. The bulkhead being elevated just five feet above high water mark, establishes the grade of the railway as nearly a perfect level. The most important question in all railway construction is thus admirably met. By elevating the track to a sufficient height to admit of the construction underneath of all the necessary buildings used for shipping, ferry or commercial purposes along the piers, the only possible interference with property or business is obviated. At the same time, by a simple and obvious combination of the railway and all such erections, a uniformity of design and an architectural completeness, most desirable in itself, will be secured.

Capacity.—A grand metropolitan railway must have at least four tracks—two for rapid and through trains and two for way passengers. The Girdle Railway provides, in reality, eight tracks on which cars can constantly move in both directions. At midday and at midnight, the through trains being withdrawn, can give place to freight cars, so that freight may be received and delivered at any point along the line, thus securing its more rapid transmission, especially in connection with shipping. There is no limit to the means of transporting passengers, and hundreds of thousands can daily be conveyed with a speed and comfort now utterly unknown. If it is objected that the line of the road is at a distance from the centre of the island, and therefore inconvenient, let it be remembered that the present location of the greater proportion of the population of the city is due to the facilities of communication afforded by the street railways, and, therefore, that the bulk of the population would eventually be distributed in proximity to this line. But above all, let it not be forgotten that a few years will find the lower part of Westchester county incorporated with New York, and containing a population as dense as that now found within the present limits of the city. The Girdle Railway, extending itself with suburban connections, will then afford those facilities for communication, the want of which has alone delayed the development of that extensive section, compelling thousands to seek reluctantly their homes in the adjoining States or on Long Island, exposed to all the annoyances and vicissitudes of ferry transportation, never unattended with danger.

Construction.—The details of construction involve questions connected with the judicious application of forces and the strength of material, not essential to be referred to at this time. Whether the supporting columns shall be cast or wrought iron or stone, whether the foundations shall be stone or pneumatic piles, or whether a series of short suspensions, with reverse anchorage, may be deemed advisable, are all matters readily determined on when the working plans are being prepared. The leading principles are a level railway, operated by steam power, elevated above the ground required for commercial purposes, securely built, commodious, convenient, rapid and constant. The design has been carefully studied and submitted to the closest engineering criticism; it is the result of a long familiarity with the subject, and an earnest desire to meet a great and increasing necessity with a positive and permanent measure of relief. It is presented to the Legislature upon its simple merits. The bill has been drawn by a gentleman familiar with the public law, and who is second to none in his deep interest for the welfare of the city of New York. If the plan fulfils the conditions required as completely as it is claimed that it does, capital will not hesitate to carry it to successful execution. Indeed, the question of capital will be the final test of any plan, whatever its merits and however favorable the legislation may be.

THE success of English astronomers on the peak of Teneriffe has induced the Russian Government to resolve on the establishment of an astronomical and meteorological observatory on Mount Arrarat, near Tiflis.

THE ENGINEERING AND MINING JOURNAL.

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ROSSITER W. RAYMOND, Ph. D., Editor,

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Report of the Commissioner of Mining Statistics.

THE report of Mr. RAYMOND, on the mines of the Rocky mountains, the inland basin and the Pacific slope, for the year 1869, is now in the hands of the Congressional printer, and awaits publication. Fully aware that the interest of such a document depends largely upon its prompt appearance, the Commissioner will spare no personal exertions to facilitate an early publication. Our impatient friends in the West should, however, remember that during the session of Congress, matters upon which immediate legislation is required receive attention at the printing office in preference to all others; and consequently the progress of work upon a report of general popular interest is frequently interrupted by peremptory orders to put the whole force of the office upon some bulky volume of evidence as to gold-panics, or cadet-auctions, or contested elections. It is therefore impossible to say how soon the report on mining will be printed. In all probability, however, that desirable event will be consummated before the first of June.

With regard to the contents of the report, we may refer the reader to the preliminary letter of the Commissioner to the Secretary of the Treasury, published in our columns several months ago. The programme sketched in that letter has been in the main fulfilled.

The Commissioner's estimate of bullion production for the year 1869 is as follows:

California	$20,000,000	Colorado and Wyoming	$4,000,000
Nevada	14,000,000	New Mexico	500,000
Oregon and Washington.	4,000,000	Arizona	1,000,000
Idahoe	7,000,000	All other sources	1,000,000
Montana	12,000,000		
			$63,500,000

This result we cannot but regard as highly encouraging. It falls short of the product of 1868, it is true, some $3,500,000; but the loss to the placer-mining industry, occasioned by the excessive drought of last summer in Northern California, Oregon, Idaho and Montana, would of itself have occasioned a much larger decrease. The steady augmentation of the product from quartz-mining has measurably counterbalanced this loss; and it is matter for special consideration, that the diminished placer-yield is due to a temporary cause, while the increased quartz-yield is but the beginning of a new and prosperous era for that branch of industry.

Most encouraging, indeed, is the advance of mining in Colorado. The mineral resources of that Territory are combined with great natural capacities for agriculture and manufactures, and with superb climate and delightful scenery. All these advantages are being rapidly made accessible by railroads; and the new progress of the Territory seems to unite the elements of stability and regularity.

Nevada, meanwhile, continues to maintain her preëminent position as the Silver State. The discovery and rapid development of White Pine has drawn attention to a belt of metalliferous country east of that which furnished the rich districts around Unionville, Austin, Belmont and Silver Peak. A wave of exploration may almost be said to have advanced from the West, breaking successively upon the mountain ranges that divide the inland basin, pausing, retreating, and then advancing again. Thus in succession have Washoe, Reese River, Humboldt and White Pine engaged the public attention. The vanguard of our pioneers now stands on the borders of Utah. For many years to come, the vast regions already skimmed by their hasty feet will continue to yield new discoveries to more careful examination; but another class of men must do this work. The genuine prospector, a product of America alone, loves to push forward in untrodden paths; and New Mexico and Arizona now contain for him the virgin Eldorado. In that quarter we may look for the next startling discoveries. Already the numerous new districts south of White Pine indicate in what direction the tide is flowing. Pahranagat, once an isolated outpost, is now connected with other mining regions by a chain of new discoveries, some of which will, ere long, attain the rank of centres of production.

Meanwhile, the older localities of mining in Nevada show reassuring signs of vitality. The great success of the Stetefeldt furnace has inspired new vigor in many a decaying camp, and will be worth more to the silver mines than the discovery of a second White Pine. The venerable Comstock musters strength again; and from the long empty echoes of the Gould and Curry we hear voices of hope. The Virginia and Truckee railroad is complete; the Sutro Tunnel is at last begun; and Washoe, in her old age, still challenges the world for an equal.

The irresistible (though stoutly resisted) fall in wages, and the reduction of other expenses of mining, will, we are persuaded, speedily produce a marked effect upon this industry. The Commissioner's report contains an elaborate discussion of this subject as related to mining in Central and Eastern Nevada, mainly from the pen of Hon. JOHN H. BOALT, of Austin. We regard it as the ablest and fairest statement of the case that has yet appeared. The blame of many failures has been too uniformly laid upon the management of superintendents. Doubtless there has been a great deal of this; but there have been at work in many districts deeper causes, strong enough to render futile the best management. A better day has dawned; and we may now begin to look for the steadily advancing sun of prosperity, instead of the occasional meteors of good luck that have heretofore flashed across a dark background of disaster.

In Oregon, Idaho (except in the Owyhee country) and Montana, the auriferous and argentiferous veins have scarcely yet been touched. Yet there is no doubt that these will ultimately prove the true and permanent source of mineral wealth. We are more than ever convinced that placer and gravel deposits are secondary products from the decomposition of veins; and that consequently no region rich in alluvial gold will fail to contain auriferous lodes. But it is quite likely that in most cases the gold in gulches, banks and bars is concentrated, and so more easily obtained; and as long as placer-mining flourishes rankly, wages will remain too high for profitable quartz-mining. The gradual exhaustion of the richest diggings brings with it a two-fold blessing, sooner or later. It directs industry both to the veins and to the poorer placer deposits. Of the latter, there is a vast extent in the Pacific States, greater, we think, than the public is accustomed to think. It is the fashion to talk of the exhaustion of the placers; but the reduction of wages from say $3.50 to $2 per day would open up an area of placer-ground as great as that now worked. In Oregon and Idaho this is emphatically the case. But the veins are the ultimate and best resource. Their product is increasing every year. They never have paid better on the average to their proprietors than during the year just passed, and they enter upon a new season under the best auspices.

It is high time that the great but scattered experience gained upon our soil in the methods and apparatus of mining and metallurgy should be consolidated and systematized. The present report makes a small beginning in that direction, and is to be considered as an earnest and sincere attempt on the part of the Commissioner to establish a general basis, upon which American science may proceed. It is hoped that he has succeeded in indicating, however imperfectly, and with whatever errors of personal observation and opinion, the particulars in which we already surpass other nations, and the directions in which we should ourselves direct our efforts for improvement. The chapters contributed by Professor W. P. BLAKE, on the Mechanical Appliances of Mining, are rendered doubly valuable by the fact that this distinguished engineer, in addition to an intimate acquaintance with American processes and machines, was able to gather at the Paris Exposition a knowledge of the best modern foreign inventions, and thus to make those comparisons which it was the direct object of the Commissioner to institute.

It may well be supposed that the preparation of so large a volume, in so short a time, has been an arduons labor. It certainly could not have been accomplished by the Commissioner, without the assistance of many generous and skilful co-laborers. We hope that Congress will order an extra edition, for general distribution, of a work containing so much useful information; and we venture to anticipate that it will be received with favor by the class it is intended to benefit, and with thoughtful attention by many readers, at home and abroad.

A Voice from Hogopolis.

"MR. STEWART, of Nevada, wants Congress to establish a free school of mines, at an expense of $50,000, with a controller at $4,500 a year, and two professors at $4,000 a year each. Any one who knows anything of mining, will at once see the utter 'ridiculosity' of the proposition; and those acquainted with the history of Senator STEWART will be satisfied that there is a huge job in it, with no sort of necessity to recommend it. Mr. STEWART, and many others, seem to proceed upon the idea that the Government of the United States was established for the purpose of aiding indigent young men in getting a professional education for nothing."

Thus speaks the Cincinnati *Times*, which, of course, knows all about mining, and is acquainted with Senator STEWART's history. Not having the same omniscient self-conceit, we cannot pretend to contradict the *Times* with authority, but we venture to set forth that our limited knowledge of mining, and our slight acquaintance with Mr. STEWART, have led us to very different conclusions. We have fancied that we could note a great and pressing necessity for a National School of Mines; and we have regarded the distinguished Senator from Nevada for years as the foremost advocate of such an institution. Our opinion of the plan now before Congress was recently published. It is not all we want, but it is better than nothing. The clause in the bill providing for free instruction will probably be stricken out. Nobody asks free instruction in the sciences of mining. But, on the other hand, no combination of students can afford to bear the expense of all the machinery of a new school, the collections, the laboratory, the first professorships, etc. The true course is to establish the school, and then charge fair rates for tuition.

The readers of the Cincinnati *Times* would feel much aggrieved if the Department of Agriculture, with its monthly reports on hominy and its annual pictures of hogs, were abolished. They don't consider *that* "aiding indigent young men to get a professional education for nothing." But it would be so, if it were not too impotent to aid anybody much. The hog crop is encouraged; why not encourage the bullion crop? The Cincinnati iron-works are protected; why not protect, in a far less objectionable way, the gold and silver works of the Pacific? It will, indeed, be a "huge job" to thoroughly instruct the miners on the public domain; but they at least know their need of help, and their very ignorance is possibly a good deal beyond the flippant wisdom of the Pork-packer.

The Steamer City of Boston—Letter from an Engineer.

TO THE EDITORS OF THE EVENING POST:

IN your fourth edition of last evening, I notice an extract taken from a Paterson paper, which was intended to suggest the probability of the "City of Boston" having taken fire from the heating of the journals of the machinery, caused by the increased speed due to the substitution of a two-bladed for a three-bladed screw.

As many of the friends of those on board may feel additional anguish from the fact that their friends have suffered the dread terrors of fire on board a ship at sea, it may be as well to show how ridiculous the conclusions of the paper quoted are. In the first place, the speed at which a screw is driven depends on the pitch or distance the screw travels ahead in one revolution, and not upon the number of blades, the resisting surface being divided into two, three or four portions, according to the judgment of the engineer; two blades being used generally where vessels are dependent principally on sails, as affording less resistance when the blades are placed perpendicularly, and the vessel driven by sail alone. Again, the shaft and all the bearings of an engine run in metal, and have no wood whatever near them, and are never, under any circumstances, allowed to run above the temperature at which water evaporates—212 degrees; for before reaching the point at which the driest wood ignites, they would so cut and bind in the journals of a large shaft as to stop the engine.

The probable fate of the "City of Boston" has been an encounter with an iceberg. One will naturally say that the captain, being careful, would reduce the speed of his ship when the depression of the thermometer would show that there were icebergs in the neighborhood, Suppose, then, that the speed had been reduced to ten knots an hour, let us see with what force the "City of Boston" would strike an iceberg of sufficient magnitude to remain practically immovable when the vessel struck it.

The "City of Boston" probably weighed one thousand tons, water in boilers say fifty tons, passengers, baggage, etc., fifty tons, freight eight hundred tons, making in all one thousand nine hundred tons. At a speed of ten knots an hour, she would move seventeen feet in one second, which would give the vessel a momentum, or force, with which she would strike, of thirty-two thousand three hundred tons, a force sufficient to crush in her bows for many feet. Besides this, let one imagine for a moment the effect upon all ponderable bodies partially secured to the vessel. The vessel suddenly stopped, boats, masts, furniture, passengers, everything about the vessel, would virtually be driven ahead at a speed of seventeen feet a second; the boilers would probably be loosened from their fastenings, the masts would be broken off, the boats would be carried away, terror would prevail, which the shrieks of affrighted and wounded passengers would heighten. The vessel would sink immediately, no boats could be lowered, no provision be made to save a single person. Should she have taken fire, there would have been at least a short time to lower boats and prepare rafts, on which some would have remained probably long enough afloat to have been picked up by steamers or sailing vessels passing over the same route.

A long enough time has now elapsed to have heard from almost every port for which a steamer or sailing vessel on that route would have sailed, and hope for the safe arrival of the "City of Boston" has almost died out even, in the minds of the most sanguine.

T. A.

Super-Phosphates.

ONE of the best signs of "reconstruction" in the South is the way in which the farmers are reconstructing their exhausted soils. The manufacture of super-phosphates is becoming a very important industry, and great quantities of these fertilizers have been employed within the last two years. Their use last year enabled the South to produce, in spite of a very bad season, average crops, and we believe that the next harvests will show some surprising arguments in favor of scientific agriculture. The great deposits of fossil phosphates, discovered near Charleston, S. C., are now actively worked by several companies.

Kerosine Lamps for Miners.

THE director of the saline works in Austria, ED. WINDAKIEWIEZ, has introduced kerosine lamps in the mines, on account of their much greater luminosity when compared with candles or the common smoky oil lamps. He found that a good kerosine lamp, containing four ounces of petroleum, was as effective as five lamps containing each three ounces of rapeseed oil.

Bullion Coming East.

WE take the following from the White Pine, Nevada, *Inland Empire:*

"When our White Pine smelting furnaces got fairly to work turning out base bullion, the question naturally arose—What shall we do with our bars? Every one, whether from the East or California, thought the proper market for them was in San Francisco, as the galena mines of the old Western States was supposed to have glutted the eastern markets with lead. Accordingly they went to the Bay City. The lead brought there four and a-half cents per pound, and the silver a dollar an ounce, no other metal in the bars being accounted for. Lately, correspondence has been opened with owners of reduction works in the East, and they offer to give from six and a-half to seven cents per pound for lead, a much larger price for silver—which is really worth one dollar and twenty-nine cents per ounce—and to give the full value of all the copper contained in the bars. So the Alsop Smelting and Mining Company, whose works are the largest and most complete in White Pine, are about to send their base bullion to the East for reduction; and probably all the other smelting works will follow suit. The copper is supposed to be sufficient to pay the price of freight. Thus will be diverted from San Francisco what might have been one of the greatest industries of the Pacific coast. While smelting is but in its infancy here, the outgoing teams are insufficient to haul away the base bullion now being produced. There were last Saturday one hundred and twenty tons of base metal bars at our various furnaces, awaiting shipment. This product would naturally have gone to San Francisco, but it will now probably all flow to the East."

An Attempt to Ruin Broadway.

Nothing can be imagined more ruinous to property holders and business people on Broadway than the preposterous Arcade Railroad. It is worse than any underground job before or since contemplated. It makes an entirely new street beneath that thoroughfare, and undermines every portion of it. In its construction business will be at a complete stand-still there, and the cost must be something enormous. It is one of the wildest and most insane schemes that ever entered the mind of a contractor or a lobbyist, and its utter impracticability alone should banish it at once from the mind of any sensible or right-thinking person. It would be impossible to calculate the extent to which it would depreciate property on Broadway and injure trade there. The process of constructing this utopian affair would damage the street to the amount of twenty millions of dollars, and that would not represent the actual amount of loss to property on that thoroughfare. The proposed underground street would be wholly untenantable, on account of the poisonous atmosphere and racket of constantly-passing trains. The tunnel, or pneumatic plans, are less objectionable, as they do not disturb the surface of the street to the same extent. The Arcade Railroad is simply a gigantic scheme concocted by insanity and fraud of the most inexcusable kind. It is looming up again in the Legislature, and an effort will probably be made during this season to secure a charter. But we have a better opinion of our law-makers than to think they would consent to such a Quixotic and villainous job. Even if they grant a charter to this company, it is more than likely that the funds to carry out the enterprise will not be forthcoming. We earnestly advise our legislators to consider the magnitude of the job, and show a little consideration towards the taxpayers by consigning it to oblivion.—*Herald.*

Coal in England.

THE fear which existed a few years since in England, that the coal supply was rapidly approaching exhaustion, has been to some extent dispelled by the proof which has been afforded by the borings and sinkings at Coton Park, near Burton-on Trent, that there is still considerable and untouched stores of coal beneath the new red sandstone and Permian formations. The explorations at Coton Park are at a considerable distance to the west of the supposed boundary of Ashby-de-la-Zouch coal field, and have been attended with very satisfactory results, several valuable seams of coal having been found, and among them one of the extraordinary thickness of thirteen feet, which will give about 12,000 tons per acre, (thirty-five feet thick in all) being equal to 33,000 tons per acre. The Coton Park coal is likely, ere long, to come largely into the market; workings on a commercial scale will be at once commenced. The estate comprises nearly three hundred and fifty-seven acres, in a ring fence, and no doubt is entertained that the Little, the Main, the Woodfield, the Stockings, the Eureka, and the Anglesey coals will be found identical with those at the well-known Moira, Gresley, and Swadlincote collieries. The Coton Park branch railway, to be constructed by the Midland Railway Company, will pass through the estate. By the knowledge of the immense coal deposits in America, reports like the above are here received with compassion, well knowing that England's fate is sealed, and the doom only postponed.

New Waterworks at Cleveland, Ohio.

THE city of Cleveland is becoming tired of the inferior water thus far used, and is going to imitate Chicago in making a tunnel under Lake Erie. By this means it will obtain water always pure a mile from shore. The Cleveland tunnel will, however, be made on more economical principles. It is so narrow that only one man can work with a pick broad as an adze. The clay turns out so strong and adhesive, that no pieces larger than one's fist can be chipped out at a time. The work is progressing night and day, the miners relieving each other at regular intervals of time. Thus far the work is only going on from the shore, but very soon the crib will be sunk in position one and a quarter miles from shore, and the work be continued from both ends at the same time, as was done in Chicago.

Dressing Roofing Slates.

ACCORDING to the London *Mining Journal*, the invention of Mr. R. HARRISON, of Port Madoc, relates to cutting both ends of the roofing slates at one and the same time, or to cutting the one end immediately after the other by machinery; also, the cutting of both sides of the roofing slates at one and the same time, or the cutting one side immediately after the other, by machinery. By these means the inventor completes the squaring or dressing of roofing slates by two operations—that is, by passing each slate twice through the machine, or if two machines are used, then once through each machine. A second part of the invention consists in showing on the surface of a register or counter the number of finished, or partially finished, roofing slates as they pass through the machine.

The Southern California Mining Excitement.

THE air of California appears to be full of exciting news from the new placer and quartz mines near San Diego. Nothing definite appears to be yet known of the extent or richness of the mines. The placer miners appear to be taking out some gold, but as yet only moderate wages have been made. Small quantities of rich quartz have been shipped and many rich strikes reported, but nothing positive has as yet been ascertained as to the extent or permanence of either the quartz or placer mines. A great excitement, however, is prevailing all over California, and the steamers and stages are going out loaded with passengers bound for the new mines.

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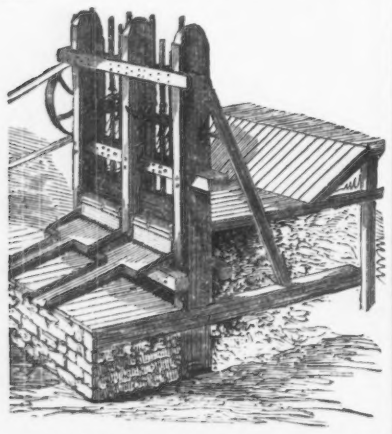

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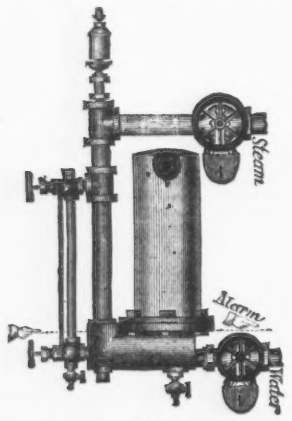

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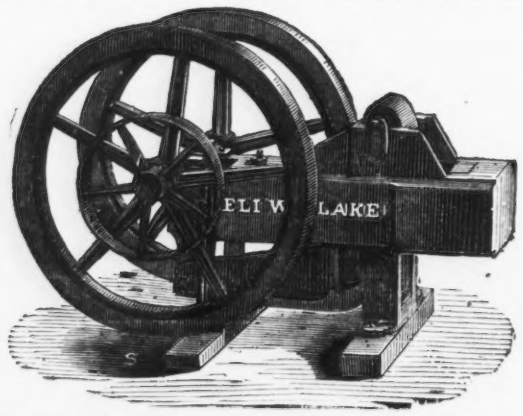

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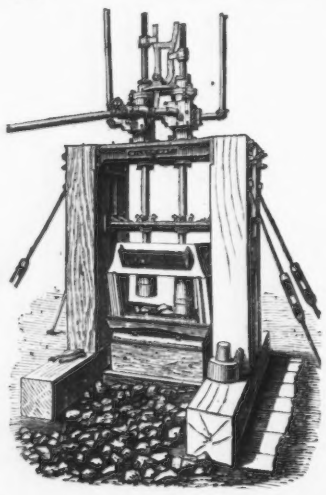

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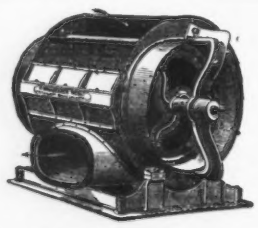

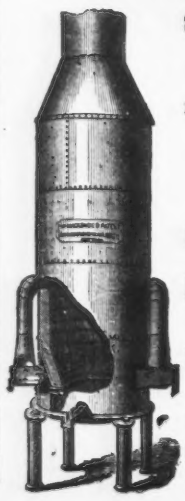

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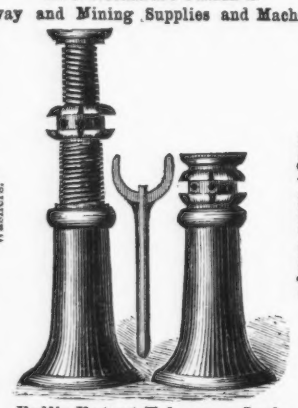

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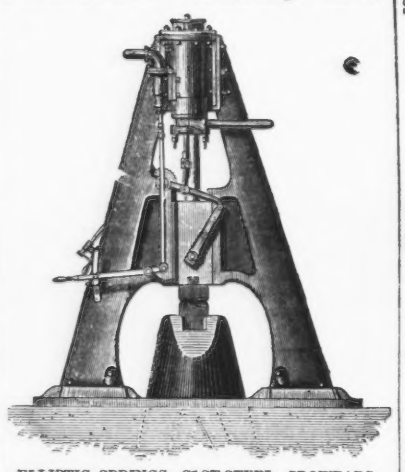

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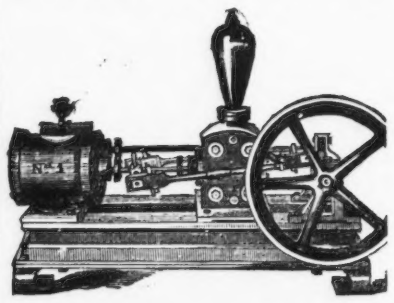

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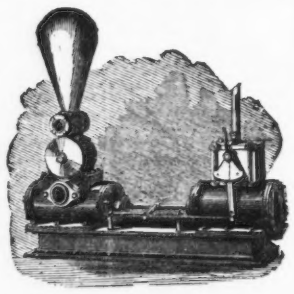

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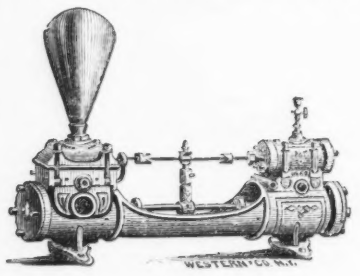

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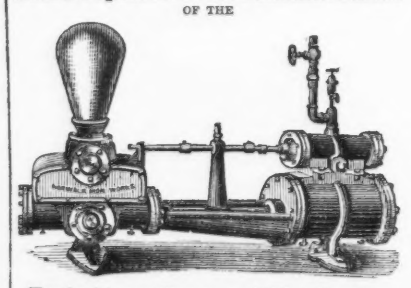

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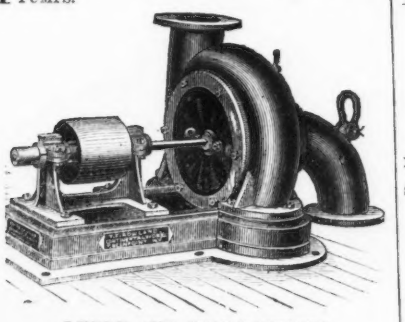

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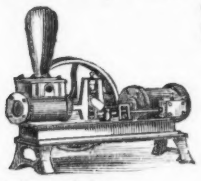

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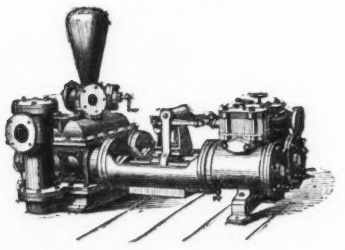

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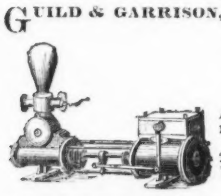

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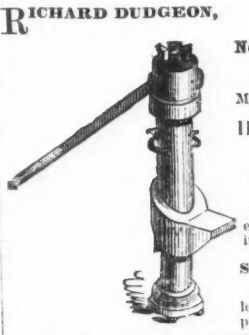

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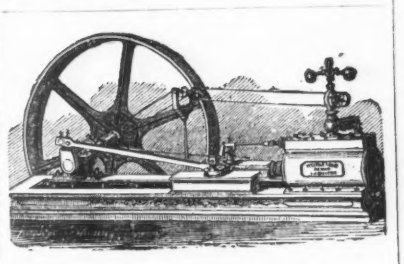

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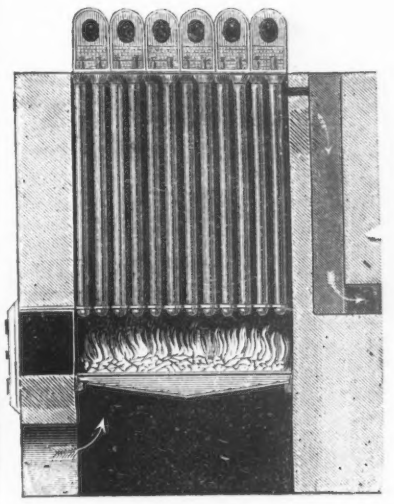

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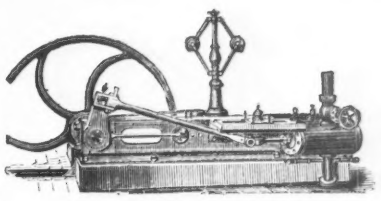

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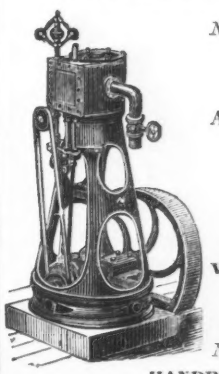

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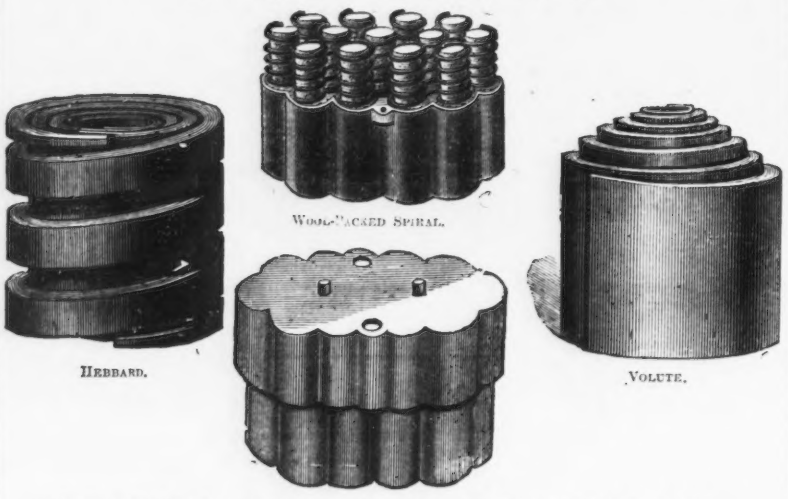

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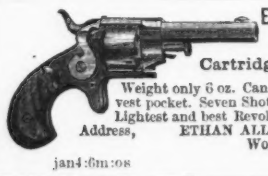

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